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THE
NATURALIST:
A
MONTHLY JOURNAL OF
Natural History for the North of England

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EDITED BY
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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RILEY FORTUNE, F.Z.S.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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LESSER KESTREL

THE NATURALIST

FOR 1927.

NOTES AND COMMENTS.

THE BIRDS OF THE BRITISH ISLES.*

Under this title Mr. Coward has prepared a third volume dealing with the British Avifauna, which is quite equal in every respect to the two which preceded it, about which we were able to say that for the money they were the best books on the subject that had been issued. In the volume under notice, Mr. Coward deals with the Migrations and Habits of the Birds, and gives observations on our rarer visitants. As usual the chapters are admirably written and illustrated. A prominent feature of the volume is no fewer than sixty-eight coloured plates by Thorburn and others, which have been reproduced from Lord Lilford's work, 'Coloured Figures of the Birds of the British Islands.' There are also sixty-eight full page plates from admirable photographs. It is difficult adequately to describe the beauty of the plates, but the publishers have kindly arranged for a reproduction of one of them to appear with this notice (see Plate I.).

JURASSIC CHRONOLOGY.

At a recent meeting of the Geological Society of London, Mr. S. S. Buckman referred to 'Some Faunal Horizons in Cornbrash.' 'The phenomenon of faunal dissimilarity within strata of a supposedly synchronous time-unit, the Cornbrash, had been observed about seventy years ago, but had not been understood. These remarks are followed by a short historical summary as to what had been done in the dating of the British Cornbrash, continued by proposals for a series of stratigraphical terms. A fuller chronology of the Cornbrash was attempted, based on a series of faunal analyses of the Brachiopod species south of the Humber. Such analyses, placed diagrammatically in relation to an overriding stratum of Oxfordian date, disclose a series of synclines, anticlines, and various non-sequences in the strata of the South Humbrian Cornbrash. The Ammonoid horizons of the Cornbrash were next considered, and the divisions of Cornbrash time on the basis of Brachiopods and of Ammonoids were compared. The Cornbrash and the Inferior Oolite were compared on these bases, and the conclusion was reached that, either the Cornbrash Brachiopoda must have evolved three or four times

* By T. A. Coward. London: F. Warne & Co., Ltd., xi. + 308 pp.
10/6 net.

more rapidly than those of the Inferior Oolite, or else that, if the time-value of Brachiopod species be the same in the Cornbrash as in the Inferior Oolite—and there is every reason that it should be—then the Cornbrash must have taken in deposition a time far in excess of that of the Middle and Upper Inferior Oolite, with all its numerous Ammonoid hemeræ. The persistence of the Cornbrash and its relation to questions of palæogeographical cartography were then considered, followed by remarks on straddle- or bridge-formations—deposits of similar character running on to connect two Periods or two Ages without any appreciable break.' We regret we have not space to print details of the discussion which followed.

CORALLIAN ROCKS.

Later, Mr. W. J. Arkell read a paper 'The Corallian Rocks of Oxfordshire, Berkshire, and North Wiltshire.' 'The geology of the Corallian formation in Oxfordshire, Berkshire, and North Wiltshire were described, and subdivisions were established. The relation of the rocks to those of the rest of the South-west of England was considered, with especial reference to the Weymouth area, and a general classification based on the South-west was suggested for England as a whole. It was claimed that such a classification admitted of the English deposits being correlated with those of Normandy, and so with the Continent in general. The subdivisions adopted for the English deposits were:—(5) Upper Calcareous Grit; (4) *Trigonia-clavellata* Beds; (3) Osmington Oolite Series; (2) Berkshire Oolite Series; (1) Lower Calcareous Grit. It was particularly emphasized that the Coral Rag was a facies deposit which may occur at any date, and that the use of "the Coral Rag" as a stratigraphical term was not permissible, its use in the past having led to many mistaken conceptions. The substitution of the term by Blake & Hudleston's "Osmington Oolite Series," of which the reefs of a definite age in Oxfordshire, Berkshire, Wiltshire, and Yorkshire, hitherto known as "the Coral Rag," are shown to be only a facies, was, therefore, suggested. The local nature of coral-reefs in the South of England was described, and their effects upon the sedimentation and the ecological associations were traced. It was pointed out that coral associations started in Yorkshire at the time of the Lower Calcareous Grit, and migrated southwards during the Corallian epoch, failing to become established in Dorset until the closing phase of the Upper Calcareous Grit.'

LINCOLNSHIRE PLACE-NAMES AND NATURAL HISTORY.

At the recent annual meeting of the Lincolnshire Naturalists' Union, the retiring president (the Rev. Sumner C.

Wood) gave an address on 'Place-names on the Map of Lincolnshire in relation to Natural History.' He said they were reminded of the hart as found at Hartsholme, the wolf as at Wrightholme, the fox at Scullar Wood, the wild boar at Swinhope and Swinethorpe, the badger at Broxholme, the hare at Hareby, the Rook at Roxby, Ruckland, and Roxholme, the crow at Crackpool (Lincoln), and Crowland, and the frog at Podehole, near Pinchbeck, and Padehole, in Louth. They might trace the familiar ash in Ashby, the oak in Ackthorpe (Louth) and Thonock (Gainsborough), the thorn in many places, the dog-rose in Hipbridge, and undergrowth of shrubs in Riseholme and Rise, and Ropley Rise, and the linden in Limber. Evidence of good pasture was seen in Butterwick, and of chalk in Cawkwell. There was the bear in Barnsdale and Braceby, the bee in Beesby, sheep in Farforth, the cuckoo in Gokewell, the fox in Revesby, the horse in Rauceby, the beetle (weevil) in Weelsby, the thrush in Trusthorpe, the raven in Ravensdale, and the suggestion of silk producing in Silkby.*

THE ABBOT OF KIRKSTALL.*

As might be expected, this volume is of peculiar Yorkshire interest, being written by Colonel Harding. It is a romance of the Black Prince, and describes Leeds and Kirkstall as they were in the latter part of the fourteenth century. In those days Kirkstall was a comparatively poor place compared with 'Rich Fountaynes.' The story refers to the love adventures of a young scholar in the time of the 'turbulent priest, Wiclis,' who, unfortunately, ends his days as a monk; but the description of the country and the accounts of the silk and wool trades, are particularly valuable, though the spelling of the period, which seems to be so much adhered to, makes the book a little difficult to read, and to bear in mind the somewhat tedious characters.

MR. WILLIAM FALCONER.

The Yorkshire Naturalists' Union, at its Annual Meeting at Leeds, elected Mr. William Falconer as the President for the ensuing year. For some years Mr. Falconer has been familiar to our readers by reason of his valuable contributions to the Arachnology of the county, and more recently he has extended his investigations outside Yorkshire. For many years he has been a familiar figure at the indoor meetings, and also at the excursions of the Union, and we feel sure that during his year of office he will give every assistance to the members in their work. Mr. Falconer served his apprenticeship as first certificated Assistant Master in Leeds under

* By T. W. Harding. Cambridge : W. Heffer & Sons, Ltd., ix.+ 317 pp., 6/-.

the Old School Board, and since 1896 was the headmaster of two schools in the Colne Valley, near Huddersfield. He was trained at Bede College, Durham, and retired in 1923, when he went to live in the neighbouring county of Lancashire. Though not a native of Yorkshire, he came into the county at the age of nine years, and has spent the greater part of his life in the county.

SOCIETIES OF INSECTS : THEIR ORIGIN AND EVOLUTION.*

Many books have been written on the societies of bees, wasps, and ants, but this does not repeat any of them. The author assumes the classic publications are known, and by basing work upon them and the more recent results of research, tries to reconstruct the origin and successive stages of the formation of these societies. There is much information, clearly given and arranged with authority. The bibliographical indices are most methodical and complete. This volume is a valuable acquisition for those interested in social insects. It shows in a striking manner what a rich harvest science may expect from the study of these insects in tropical regions, and for this reason, deserves particular appreciation from colonial circles.

GEOLOGICAL LITERATURE.

We have received the 'Geological Literature added to the Geological Society's Library during the year ended December 31st, 1925,' which is more valuable than recent lists, as it has a 'Subject Index,' though, on comparing this with the Subject Indices formerly published, it seems short in more ways than one. This is probably accounted for by the fact that North American papers have not been included, as they occur in a bibliography issued by the United States Geological Survey. Only those maps published as separate sheets are included, and only the names of fossils appearing in the *tities* of papers; the Zoological Record being said to meet requirements in this respect. We have not had an opportunity of carefully testing many of the items, but the few we have noticed are unfortunate. For example, the well-known Kelsey Hill Gravels, originally described by Prestwich, and now referred to in all the important text-books, are peculiarly interesting to the present writer. On looking under 'Kelsey Hill' in the 'Subject Index' the name does not appear. Being certain that something had been written on the subject, he had to look under the various authors' names likely to have written thereon, and eventually he came to 'Lamplugh,

* 'Les Sociétés d'insectes, Leur origine, leur volutéion,' par William-Morton Wheeler, professeur à l'Université d'Harvard. 1 volume in-16 de 472 pages avec 61 figures dans le texte, 25 fr. 20. Gaston Doin et Cie, 8 Place de l'Odeon, Paris (VI.).

G. W.,' Here certainly is an entry, 'Kelsey Hill, Kirmington and other Drift Problems.' This gives a clue, and he looked under 'Drift,' 'Glacial,' 'Gravels,' etc., without result, although he found 'Glacial Clay,' and 'Glacial Deposits,' but elsewhere. A note in one of the Introductory paragraphs gave a hint that the place-names may be under the counties, so he looked to 'Yorkshire,' but in vain; though two other items by Lamplugh dealing with Glacial Beds in Holderness are given. Under 'Lincolnshire' the paper appears, presumably as 'Kirmington' is also dealt with.

'THE NATURALIST' ITEMS.

In *The Naturalist* a paper appeared on 'A Rare Map by William Smith,' a copy of which was sent to the Geological Society's Library. It is not indexed under 'Rare,' 'Map,' 'William,' nor 'Smith,' so that presumably it does not appear in the Subject Index at all. Having written obituary notices in this journal relating to such well-known geologists as Bedford, Whitaker, Sewell and Walton, the writer was desirous of ascertaining what had been written elsewhere about these people. None of them, however, is mentioned in the subject Index. A casual reference to the word 'Obituaries,' however, informed us, quite correctly, that the desired information can be obtained in referring to the *author's* list. It was quite an afterthought that we decided to look under 'O,' however, for an obituary notice of each of these four people. As some of them could not possibly have written any papers during the past few years, one was hardly likely ordinarily to refer to the 'list of authors' of 1925 for the information.

NEW KIMMERIDGE LAMELLIBRANCHS.

In a paper on 'A New Genus of Lamellibranchs (*Hartwellia*, gen. nov.) from the Upper Kimmeridge Clay of England, with a Note of the position of the Hartwell Clay,'* Dr. F. L. Kitchen remarks upon nomenclature and the giving of names to new species. He says 'The task of applying a nomenclature best fitted to express the facts of true relationship in fossil shells is always a difficult one. In the case of Jurassic and Cretaceous ammonites it is notorious how the praiseworthy efforts of specialists to indicate the independence of the innumerable separate short-lived branches thrown off from the main stocks have led to a cumbersome and frequently unlovely nomenclature, the outcome of intensive studies and the separate generic labelling of each recognized lateral branch-species or short genetic series, as the case may be. The names, though inevitably, are cumbersome by sheer weight

* Printed in the 'Annals and Magazine of Natural History,' Ser. O, Vol. XVIII., for November.

of numbers ; they are frequently unlovely by the choice of their authors, and in some cases have been made to appear more forbidding by the failure to latinize the component roots in accordance with conventional procedure (*e.g.*, the generic names *Kuklokosmokeras*, *Katakosmokeras*, *Behemoth*).

GEOLOGICAL CRITICS.

' Yet the introduction of a more complex palaeontological nomenclature has often been hailed with expressions of dismay by many geologists. It has even been sought to attach a certain approbrium to those palaeontologists who are most scrupulous and most progressive in the application of critical and analytical methods. Such geological critics have shown an imperfect realization of the important bearing of the modern palaeontology on the standard of exactness in stratigraphy, by means of the zonal method. In this country, protests have been heard from eminent geologists as well as from others of less renown. For example, Prof. L. Dudley Stamp, referring to zonal work, has recently spoken on behalf of "the ordinary geologist who cannot spend a lifetime in learning to detect the minute differences between zonal fossils on which these refinements depend." He states that while zonal work may be useful, "it is apt to appear not only superfluous, but distinctly annoying" to that kind of geologist. We may pass over the exaggerated reference to the need of a lifetime's work in interpreting the evidence for zonal differentiation ; also the implied reflection on those who profess to be geologists, none of whom ought to feel grateful for these phrases. The quotation serves to illustrate an attitude towards detailed applied palaeontology, probably adopted through misconception.'

SEA SNAKES.*

Sea Snakes as such are similar in general appearance to ordinary land snakes, excepting that they have changed their habitat, and as a consequence certain anatomical modifications have occurred. Sea Snakes are found principally between the Gulf of Persia and the South of Japan, and in the seas around Australasia. The present monograph is the result of an examination of the material in the British Museum, as well as an investigation made by the author of specimens in most of the important museums in the world. The monograph deals systematically with each species, and there are diagrams of the more important anatomical characteristics, and plates. Had the title been *Sea-serpents* the sale of the book would be considerably greater, though we imagine many of those purchasing would be disappointed!

* 'Monograph of the Sea Snakes (Hydrophiidae)', by Malcolm Smith. London : The British Museum (Nat. Hist.), xvii. + 130 pp., 10/- net.

SIXTY-FIVE YEARS OF YORKSHIRE GEOLOGY.*

E. HAWKESWORTH.

FOR the first few years of its existence, our Union, or the 'West Riding Consolidated Naturalists' Society' as was its title at first, managed to carry on without a President, and it was not until 1870 that the necessity of such an office was realised. For some years the office was held by prominent local workers, since then, when the Union had become established on a sure basis, the office has been held in turn by a long line of distinguished scientists. Its constitution provides that 'the Executive is empowered to offer the presidency to the man of science or position connected in some way with Yorkshire (whether by birth, training, present or former residence, or other association) whose acceptance of it shall, in their opinion, best tend to advance the objects of the Union.' You have done me the great honour of electing me to the position. Being a Yorkshireman by birth, and life-long residence, the geographical qualification is satisfied, but my claim to be a 'man of science or position' is extremely shadowy, so my position in this chair causes me considerable misgiving, and my fear is that the addition of my name, without any academic distinction, title, or any other 'handle,' may detract from the list of our illustrious past-presidents. My active connection with our Union has been a long one, dating back over forty years, first as an associate, and since 1891 as a member. As one of its hon. secretaries from about 1895 to 1902, my duty was to arrange and carry through all its meetings, my late esteemed colleague during those years, Mr. Denison Roebuck, confining his attention to finance and the publications of the Union. My office as your hon. treasurer has continued for fourteen years, and now the claims of other duties, and a desire for a little more leisure, compel me to relinquish that office, with some regret, modified by the knowledge that the Union is now in a sound financial condition.

The proper fulfilment of the duty of these offices has made scientific work, of any importance, almost impossible, and one notes, with satisfaction in this case, that whilst our constitution defines the qualifications, it does not stipulate the nature of the address which he is 'expected' to deliver to the members and associates at the expiration of his year of office. The addresses of many of my predecessors have been expositions of original scientific research. One of our

* Presidential Address to the Yorkshire Naturalists' Union, delivered at Leeds on December 4th, 1926.

past-presidents, whom I hold in the highest esteem, suggested that my address be 'Geology in the Service of Man,' certainly an attractive title, and very kindly sent me ample material for its construction, but mature consideration led me to believe that a form of geological stock-taking might be interesting, and maybe profitable.

By the time our Union was originally founded in 1860, the science of Geology had made very considerable progress, and Yorkshire, presenting as it does almost an epitome of the geology of the country, received the early attention of many famous workers. William Smith had studied the secondary rocks in comparison with those of the south-west of England. Adam Sedgwick, whilst devoting most of his skill to the older rocks, had described the Magnesian Limestone. John Phillips, a Yorkshireman by service, if not by birth, had a quarter of a century before published his epoch-making work on the Geology of Yorkshire, which to this day is looked upon as a standard authority, and is a lasting monument to his physical powers, for one cannot fail to be struck by the way in which he tells us he traversed and re-traversed the county, by his keen faculty of observation, by his facility of description, and his aptitude as a draughtsman. Dean Buckland, Murchison, Agassiz, W. C. Williamson, De la Beche, Bean, Martin Simpson, H. C. Sorby, and many others had assisted in laying down the broad lines of the geology of the county, and to a great extent filling in the details. Large collections of fossils had been made, and were either in private hands or in the museums of York, Leeds, Hull, Scarborough, and other places.

The forerunner of the Yorkshire Geological Society, originally styled the 'Geological Society of the West Riding of Yorkshire,' with the object of 'collecting and methodising geological and technical information in connection with the coal-field of Yorkshire,' was founded in 1837, altering its title so as to embrace the whole of the county in 1877, and later dropping from it the term 'Polytechnical.' It has done and continues to do a great work; its *Proceedings*, regularly published from the first, are of great value, and it is gratifying to note that for many years most of the active geologists of the county have been both members of that Society and of this Union.

So much for the past. To answer the question as to the branches of geological knowledge in which the advances made since 1860 have been the most important, would be an exceedingly difficult matter, if not impossible. Great progress has been made in every department of research. One might perhaps venture to mention specially three or four:—

1. 'Zoning,' by which our knowledge of practically all

our sedimentary rocks containing fossils has been extensively developed.

2. Determination of the components of the detrital rocks, and of the character of the detritus, thus making it possible to indicate their source, and the physical conditions under which they were deposited, together assisting us to re-construct the geography of former times, which has been well-said to be the main object of geology.
3. Economic Geology.
4. Glacial Geology.

1. **ZONING.**—This, after all, is only an amplification of the great principle originally expounded by Wm. Smith, and extended by his nephew, John Phillips, that rocks are to be identified by the fossils they contain. These two masters applied this method on wide and general lines—their index fossils characterised well-defined strata, of marked thickness. Now the method has been reduced to exceedingly fine points, it is said that in some cases the zone is not thick enough entirely to contain the zonal fossil, though this may be somewhat of an exaggeration. Whilst the earlier geologists co-related rocks in different parts of the country by general fossil evidence, the zoning of recent times is based upon the occurrence and persistence of a particular family, genus, or species. The earliest work of this description in this country seems to have been in zoning the Jurassic rocks, especially the Lias, by means of their Ammonites, probably because the stratigraphy was fairly simple, and sections numerous and accessible, also that these fossils were plentiful, in a good state of preservation, and their differences so well marked in most cases as to be easily identifiable. J. W. Judd was the first member of the Geological Survey to use Ammonites for zoning purposes, though W. C. Williamson so far back as 1834 divided the Lias into palaeontological zones. Tate and Blake, in their carefully detailed description of the Yorkshire Lias, published in 1876, divided that formation into eleven zones characterised by their Ammonites. Of recent years these have been subdivided into thirty-one by S. S. Buckman, who, by careful examination, found differences, in many cases very minute, in specimens hitherto regarded as similar species, but sufficiently marked, in his opinion, to entitle them to new specific rank. He also divided the Lower Oolites into twenty zones, and the Yorkshire Middle Oolites and Cornbrash into seventeen, all distinguished by different Ammonites. The sub-division of the Lower Palaeozoic rocks was a much more difficult problem, especially in our county, owing to the small area covered by them, the difficulty of access, the obscurity and

complication of their stratigraphy, and often the paucity and ill-preservation of their fossils. For these reasons, apart from area, a satisfactory sub-division of these old rocks was found to be of great geological importance, and some success has been achieved in zoning the Silurian and Ordovician rocks of north-west Yorkshire by means of the Graptolites contained in them, thus making more clear their relationship with rocks of similar age in other areas. In this connection one remarkable fact demands mention—Dr. Elles has found that the Graptolites in the lower Ashgillian shales (Ordovician) in the Cautley area, are of a more complex character than those of the overlying Silurian rocks, which appears to be rather a reversal of the usual succession from lower to higher forms.

In 1895, on the suggestion of Messrs. Marr and Garwood, a committee was formed by the British Association, for the study of the life zones of the British Carboniferous rocks, which, in the following year, issued a list of directions and a plea for workers, but there seems to have been little active response for a few years. Under date December, 1985 (*sic.*), in *The Geological Magazine*, 1896, p. 46, Dr. F. A. Bather draws attention to the importance of the Crinoidea, and is certain that they would give results in zoning quite as important as those to be derived from corals, trilobites, brachiopods and cephalopods, but little or no notice appears to have been taken of this. At this time the late Dr. Wheelton Hind, another past-president of this Union, had been busy for some years on the palaeontology of the Carboniferous rocks, basing his classification and co-relationship of the rocks in various localities mainly on the molluscan fauna contained in them. His researches compelled him to disagree with the then recognised divisions of the rocks. He argued that the Yoredales were largely equivalents of beds which had elsewhere been referred to the Mountain Limestone series, whilst some local beds in the Yoredales may be the equivalents of the Millstone Grit. Whilst making two divisions of the whole system, stratigraphically, the Upper Carboniferous, or Anthraciferous, and the lower, or Calcareous, he required three palaeontological divisions, each with a distinct fauna—

Coal Measures, rich in fish and molluscan remains (fresh-water).

Lower Coal Measures and Millstone Grit, marine, but littoral.

Limestone, fauna essentially marine, rich in corals, polyzoa, many lamellibranchs, some gasteropods, some peculiar cephalopods, and very rich in brachiopods.

He did an enormous amount of geological work, both

in the field and in the study, and his marked enthusiasm acted as a stimulus to many other workers. With all his great attainments, he had the genuine humility and caution of the true scientific mind, and the following extract from one of his papers is still worthy of attention :—‘ Geological science knows no hard or fast lines, and classification, though founded on natural laws, is not a law of nature, but purely utilitarian in purpose ; but, to be of any service at all, even the classification and division of series of strata must be based on the soundest paleontological evidence.’ *

His investigations (along with J. A. Howe)† of the beds which lie between the top of the Mountain Limestone and the Millstone Grit, as typified by the section shown in Pendle Hill, and the comparison of these with similar rocks in other districts added considerably to our knowledge of the so-called Pendleside Group. Of greater interest are his deductions from the fossils found in them. By taking some fossil, or group of fossils, with habits similar to their living representatives, and ascertaining at what horizons they occur in different localities, it might be possible to draw lines in the rocks connecting points of similar conditions of deposition, which lines he called isodietic. For instance, the distribution of the Nuculidæ seemed to prove that the necessary conditions of deposition and environment for this family did not exist in the Pennine area until late Carboniferous times. These and other lamellibranchs, living in muddy waters, could not exist in the clearer waters in which limestones were being formed, and as they are found at later horizons, passing from north to south, it shows that the influence of a land surface gradually spread farther and farther south, as is shown by the tendency for the deposition of limestone to be interrupted by the deposition of detrital deposits, and eventually the cessation of the formation of pure limestones. It is difficult to make this clear in a few lines, but the observations are of the greatest possible interest to the geologist and biologist.

The origin of the Craven Reef-Knolls has given rise to much discussion, Tiddeman considering them to be accumulations of marine organisms, or real reef-knolls—Marr contending for their tectonic origin. In connection with the Bradford meeting of the British Association, some years ago, our Union arranged a week-end excursion to Grassington, and one of the most representative gatherings of British geologists met on the ground, expecting, with the presence of the two protagonists, to settle the matter, once for all, but, unfortunately, at the last moment, one of them was taken ill.

* *Geol. Magazine*, 1897, p. 212.

† *Q.J.G.S.*, Vol. LVII., August, 1901.

It may be that the truth lies somewhere between the two theories.

The first really important advance in working out the life zones of the Lower Carboniferous was made by the late Dr. Arthur Vaughan, who devoted himself with rare energy to the minute examination of the complete succession of these rocks in the Avon gorge, and their fossil corals and brachiopods, which he used as the indices for his zones. Time will not permit of even an outline of his discoveries and conclusions, but, taking this section, and his ideas as a type, these rocks in almost every area where they are exposed in Western Europe have been divided into zones and sub-zones on similar lines. In our own county, Professor E. J. Garwood has paid particular attention to the north-west corner, about which he has published memoirs of extreme value; Mr. Cosmo Johns has worked in the Ingleton and Wensleydale areas; Dr. A. Wilmore in Bowland and Craven, and Dr. Wheelton Hind with Mr. J. A. Howe on Pendle Hill.

The coming in of the coarse sediments of Upper Carboniferous times tended to destroy the coral fauna, so some other group of animals had to be found upon which to base a classification of the rocks of that period, and the Goniatites have been made use of for that purpose by Mr. W. S. Bisat, who during the last few years has done work of great importance in this connection.

The zoning of the Cretaceous rocks by means of the echinoderms and belemnites, by Dr. A. W. Rowe and others, threw much light on the history of our Yorkshire Chalk.

2. DETRITAL ROCKS.—The most important work yet done in connection with the determination of the components of detrital rocks is that of our member, Dr. A. Gilligan, Professor of Geology in the University of Leeds, described by him to the Geological Society, and published in the *Quarterly Journal* of that Society (Vol. LXXV., Part 4), and justly described by one who took part in the discussion which followed the reading of the paper as 'the most complete account of the petrography of a sedimentary series that had ever yet been published.' Dr. H. C. Sorby, the first president of this Union, so far back as 1859, investigated the material making up the Millstone Grit rocks, but for over half a century no other systematic move on similar lines was undertaken. Seeing that this series of rocks, forming a thickness of some thousands of feet between the Coal Measures and the Yoredales, covers an area in Yorkshire alone of 840 square miles, a knowledge of its formation and origin must be of great interest and importance. Dr. Gilligan examined, microscopically and chemically, large numbers of specimens of the different fragments of which the rocks are made up—pebbles of quartz,

feldspar, pegmatite, igneous rocks, metamorphic and sedimentary rocks. The quartz is the main constituent of the rock, and the pebbles are of many colours, one of the principal being a blue or opalescent tint, and all these quartz pebbles, in the microscope, show that they have been derived from rocks that have been subjected to mechanical deformation. The remarkable feature of the feldspar pebbles is their freshness. Especially from the Middle Grits and Rough Rock of Airedale, many pebbles of igneous and metamorphic rocks were obtained, some of them of large size, the largest, strange to say, being found in the fine-grained beds, containing fossil trees, so that they have evidently been carried here by floating vegetation. Amongst these pebbles were granites, porphyries, and one only of diorite, whilst the Middle Grits of Silsden yielded a number of large pebbles of schists and gneisses, one of the former having been definitely identified as coming from the Blair Athol area. Many pebbles of chert were found, but they differed from the cherts of our Carboniferous Limestone rocks. Some rare examples, found in different beds, and in different localities, show an oolitic structure, which agrees in a remarkable way with a pebble found in the Torridonian of the north-west Highlands of Scotland.

Most of the quartz grains in the finer sediments contain inclusions of minerals, glass, gas and fluid cavities, and black dust, and from these inclusions it is possible to deduce the type of rocks from which these grains have been derived, again the ancient rocks of the north-west Highlands.

Another line of research was taken in the separation and identification of the so-called heavy minerals in the grits, which included, amongst others, garnet, iron pyrites, magnetite, rutile, zircon, calcite, tourmaline, andalusite, topaz, and monazite, the former being the most abundant, the latter the most important and interesting, as it is present in practically all the beds examined, and up to 1917 the only other rocks in the British Isles from which it was recorded were the Loch Dee granite, and in Cornwall. Dr. W. Mackie has since found it to be 'unexpectedly widely distributed' in the granites of the North of Scotland. The presence of monazite in our Millstone Grit, and its absence from the granites of the Lake District, with other evidences, makes it clear that the sediments did not come from that direction.

The land mass from which the material forming the Grit was derived must have been largely made up of a granitoid gneiss, that is granite altered by intense crushing, with veins of pegmatite, some unaltered granite, and considerable masses of schists. There must also have been limestones, from which the chert pebbles were derived, and other sedimentary rocks.

The Millstone Grit rocks, consisting as they do of grits and sandstones, varying from the coarsest to the finest texture, with thick intercalations of shale, with here and there beds containing marine fossils, represent the deltaic deposits of some huge river like the Mississippi, receiving tributaries from regions whose climates differed. Dr. Gilligan estimates that the Millstone Grit once covered an area of 2000 square miles in Yorkshire. Taking it at an average thickness of 1000 feet, 'this would represent 400 cubic miles; or it may be built into the form of a range of hills, which would be 800 miles long, 1 mile in diameter at the base, and 1 mile high,' so that an enormous amount of material must have been removed from some pre-existing land-surface to form such a mass, and this without reckoning the Millstone Grit of adjacent counties. The fact that the beds become thinner to the south and south-east points to a northerly source of the sediments. The presence or absence of certain mineral constituents rule out the Lake District and the southern part of Scotland as being the source, and the only possible area 'lay still farther north, in what is now the north of Scotland, and its extension lay east with a larger Scandinavia, thus forming part of a great continental land, the limits (norther and western) of which it is not at present possible to define.' The earth movements which caused the high relief of this land mass must have been great, also successive, as is shown by the fact that the beds at the base of the Millstone Grit are coarse, the Middle Grits are finer, the Rough Rock coarse, and the succeeding Coal Measures fine, whilst the dominant constituents of the two coarse divisions are the same, and must have come from the same source. The sediments are such as could only have been transported by a river of steep gradient. The current bedding of the grits confirms the directions of the river-flow. Many other facts are adduced in describing the climatic conditions prevailing on this great northern continent.

The description of the results of this wonderful piece of research forms one of the most fascinating geological stories that has ever been told, and no doubt it will prove the forerunner of useful work on the derivation of the sediments of other periods.

The great beds of sandstone in the Trias are now considered to be made up of blown sand, and comparisons of these, with their accompanying marls, pebble beds, and beds of rock salt, with conditions prevailing in other parts of the world, show that period to have been one in which desert conditions prevailed.

(To be continued).

**THE YORKSHIRE NATURALISTS' UNION'S
SIXTY-FIFTH ANNUAL REPORT
FOR 1926**

Presented at Leeds, December 4th, 1926.

The Sixty-fourth Annual Meeting was held at Huddersfield on Saturday, December 5th, 1925, and a brief report of the Proceedings appeared in *The Naturalist* for January, p. 6.

The Presidential Address of Prof. J. H. Priestley, B.Sc., D.S.O., F.L.S., entitled 'Light and Growth,' was printed in the issues of *The Naturalist* for February and March.

Field Meetings have been held in the various County Divisions as follows :—Askern (May 1st), Hornsea (Whit Week-end), Castle Howard (June 19th-21st), Farnley Park (July 17th), Middleham (August Bank Holiday Week-end), and the Fungus Foray at Mulgrave Woods (September 18-23). Additional Field Meetings have been held by the Botanical Section at Malham, by the Entomological Section at Allerthorpe and by the Conchological Section at York and Sutton Common. The attendance at these meetings has not been very uniform, a circumstance mainly attributable to unsatisfactory facilities afforded for travel during a year of severe industrial unrest. Reports of the meetings have appeared in *The Naturalist*. The Union is indebted to the Local Secretaries, whose work in the interests of the Excursions is greatly appreciated by the Executive. Mr. T. Stainforth, B.A., B.Sc., was elected Local Secretary for the S.E. Division.

The Excursions for 1927 will be as follows :—

N.E. Hayburn Wyke (Easter Week-end, April 18th).

Mid. W. Grassington (Whit Week-end, June 6th).

S.E. Allerthorpe (July 18th).

N.W. Sedbergh (August Bank Holiday).

S.W. Meltham (September 14th).

Entomological Section.—Buttercrambe Woods, W. Stamford Bridge, June 18th.

Fungus Foray.—Egton Bridge or Stamford Bridge, September.

Annual Meeting.—Harrogate (December 3rd).

Membership.—The numerical strength of the Union is practically stationary. Well-attended Meetings and Excursions by present members are necessary in order to keep alive and to spread enthusiasm among those from whom the Union's strength is recruited. Members now number 402, and the enrolment of new members is counterbalanced by deaths and resignations. The following members were elected during the year :

Allen, Fred, Greenfield, near Oldham.

Allen, Rev. Montague Yate, M.A., Moss Vicarage, Doncaster.

Ardill, Clifford, 2 Miles Place, Chapel Allerton, Leeds.

Cocks, Miss Annie, B.Sc., 9 Falmouth Avenue, Bradford.

Dawson, Miss Mabel, B.Sc., 19 Leeds Old Road, Bradford.

Dibb, John Rathnall, 'Barrule,' 45 King George Avenue,
Chapel Allerton, Leeds.

Dixon, William Law, Bent House, Littleborough, nr. Manchester.

Dufty, F. T. North, 18 Brook Street, Skipton.

Edmondson, Miss C., West Cliff, Keighley.

Forrest, W. J., 43 Beaumont Road, Whitley Terrace, Bradford.

Foster, Henry, 48 Ridge Road, Upper Armley, Leeds.

Gummer, Ald. Geo., J.P., 'Strathern,' Bridlington.

Hilary, Mrs. Mabel, Fellfoot, Bingley.

Johnson, G. C., 18 Hovingham Terrace, Harehills, Leeds.

Kaye, Mrs. H., West Cliff, Keighley.

Lealman, Wilfred S., West End, Kirby-Moorside.

Morehouse, Mrs. Elsie M., 23 Queen's Road, Doncaster.
 Robb, Miss C. M., Catton Hall, Thirsk.
 Tetley, Miss Ursula, B.Sc., The University, Leeds.
 Veale, Geoffrey, The Grove, Ilkley and Balliol College, Oxford.
 Woodcock, A. J. A., M.Sc., F.E.S., Clifton Manor, York.

The Affiliated Societies.—These Societies number 38. Reports which reach the Executive indicate that membership is being well maintained, although one or two societies with headquarters in industrial districts find even the affiliation fee a severe tax upon their financial resources. It is hoped that it may soon be possible to devise a lecture plan for the benefit of local societies. In the meantime, however, the Hon. Secretaries and many members of the Executive continue to assist in filling the programmes of Societies from which requests are received.

Obituary.—The Executive regrets to record the following death roll, which includes the name of a past President, G. W. Lamplugh, F.R.S., S. Bennett, Rev. W. H. Oxley, M.A., John Cryer, Leonard Gaunt, G. Grace, B.Sc., W. H. Parkin, Thomas Smith.

The Presidency for 1927 has been offered to and accepted by Wm. Falconer, Esq., F.E.S., Liverpool, whose reputation as a British Arachnologist rests very largely upon his work among the spiders and mites in Yorkshire. The Union wishes to record its indebtedness to its retiring President, E. Hawkesworth, Esq., whose term of office has been conspicuous by his regular attendance at the General Field Meetings of the year.

The Honorary Treasurership.—This office, which has been so admirably filled for the past 14 years by the retiring President (E. Hawkesworth, Esq.), has been rendered vacant by his resignation from this office also. The Executive wishes to place on record its special appreciation of these long and responsible services to the Union, during which, through a series of years of war and economic stress, he has had to face the difficulties of financial strain shared by all kindred Societies, and Mr. Hawkesworth retires after the presentation of a balance sheet which shows a highly satisfactory condition of the Union's financial affairs. The Executive is pleased to record the election by the General Committee to-day of Mr. T. D. Persy Fisher, Leeds, as Hon. Treasurer.

The Honorary Secretariate.—A temporary appointment in the Cornell University, Ithaca, U.S.A., has necessitated the absence of Dr. W. H. Pearsall, F.L.S., during the latter part of the year, and he has the best wishes of the Executive for the successful prosecution of his duties abroad. Since July the secretarial duties have been fulfilled entirely by Mr. F. A. Mason, F.R.M.S., and the Executive registers its appreciation of his services.

General Committee.—The following have been elected members of the Permanent Committee of the Union, viz., G. T. Lyle, F.E.S., Miss M. Hewlett, M.Sc., W. G. Bramley, Miss D. Hilary, B.Sc.

VERTEBRATE ZOOLOGY COMMITTEE.

West Riding (H. B. Booth):—The following notes are in addition to any that may have appeared in *The Naturalist*.

A Kittiwake, apparently in good condition, and only just dead, was picked up by Mr. Geoffrey Veale on March 16th at Marsh Gill Reservoir, near Ilkley. Mr. Veale also reported that at the same time there was another gull on the opposite side of the reservoir which he took to be the mate of the dead bird.

On October 3rd a Cormorant came on to the River Aire at Myrtle Park, Bingley. It was still there on October 17th. It is a bird in immature plumage, white belly and brown spotted lower breast, and by its large size apparently a male. With my field glasses I endeavoured

to see what kind of fish it was bringing up to swallow, and found they were mostly small fry, probably Minnows, which abound in this reach of the river. Now and then it got a fish five or six inches long. On March 16th I watched a Common Buzzard for a quarter of an hour circling over Malham Cove, and hoped it was going to nest there.

Mr. W. E. Bramley informs me that a Slavonian Grebe was seen at Fairburn on February 15th. Mr. R. Chislett reports that following the cold weather about Christmas, a Great Spotted Woodpecker for some time paid visits to his garden on the outskirts of Rotherham.

Migration.—Owing to the fine and warm spell early in April of 1926, several of our summer migratory birds arrived very early, while others arrived about their usual dates, and a few species were actually late. The Willow Warbler, I think, broke all records here. A few were seen and heard by Mr. J. Astin on April 6th near Shipley, and by April 10th they were widely, but thinly, distributed.* The Cuckoo also was early, being heard in Ben Rhydding from April 23rd onwards. Sand Martins and Swallows were early, but the Tree Pipit, Yellow Wagtail and Swifts were very late. The Swifts arrived in a body at Ben Rhydding on May 12th, and departed earlier than usual, as I did not see one there after August 17th. Mr. Bramley informs me that he saw a Swift at Fairburn on September 1st.

Two unusual Airedale birds, viz., the Pied Flycatcher and the Chiffchaff, put in an appearance near Bingley, and sang continuously for two or three weeks in May. Evidently they were unpaired males, and they both disappeared. It is rather curious that the Chiffchaff came to the exact spot where a pair of Chiffchaffs nested in 1916 and 1917 (*The Naturalist*, 1917, p. 35, and 1918, p. 35). I have to thank Mr. S. Longbottom for first reporting them. Mr. Bramley states that Hooded Crows, which have been returning to the Fairburn district in fewer numbers for a few years, have increased this autumn.

The extraordinary large gathering of Starlings which wintered at Denholme in 1924-5 (*The Naturalist*, 1926, p. 8), was not repeated. The weather of the end of 1925 up to Christmas was inclement and very cold, and the birds disappeared. Mr. I. College tells me of a huge gathering at the same place on March 28th, 1926, 'the largest numbers he had ever seen,' which most probably would be a return immigration of the same birds and before their dispersal.

Nesting Notes.—On a smallish pool on a moor near Clapham on June 5th I saw a female Garganey, with five or six ducklings. In their company were a couple of duck Teals, each with ducklings, which made the identification less difficult. She looked quite slim and graceful against the dumpy duck Teals, and, of course, much greyer, while the spots on her back appeared almost as indistinct horizontal lines. So far this is first record of the nesting of the Garganey in the West Riding, though it is in the same district as the reported nesting of the Garganey in 1919, which proved to be a Teal (*The Naturalist*, 1920, p. 39). The Garganey ducklings would be about ten or twelve days old, and those of both broods of Teal would be only two or three days old.

This year Mr. Rosse Butterfield found a pair of Little Owls with nearly full grown young in a hole in an old oak tree, opposite Niffany, about a mile from Skipton, in the direction of Broughton. Mr. Bramley writes that the Little Owl has been noticed on several occasions at Fairburn this year.

Great Crested Grebes are quite holding their own in spite of the Pike and the large Trout taking the young birds. The head gamekeeper at Malham Tarn informs me that there were four pairs on the Tarn this season, of which two pairs succeeded in rearing young. There was a

* I actually heard and saw a Willow Warbler on April 5th, but it was at Silverdale, in North Lancashire—a sheltered spot.

pair on the lake at Coniston Cold, and Mr. Bramley writes that at Fairburn they did fairly well, at least eight young being reared.

Captain J. H. Preston tells me that a pair of Jays endeavoured to nest in the Eshton Woods, near Gargrave, in 1925. He saw the birds himself, and tried to shoot one; later the gamekeeper shot one or both birds.

As Reed Warblers are evidently withdrawing from the West Riding, it is pleasing to hear from Mr. Bramley that at the least seven nests were found around Fairburn this season. They were all built in willows, and from twenty to forty feet away from water.

Keasden Black-headed Gullery had a slight increase on the past year, or close upon 500 pairs. At Bardon Upper Dock about fifty-five birds rose from the actual nesting site on our approach, but there were others around, and on the reservoir. These birds were very wild, and rose high in the air as if persecuted. At Fairburn, Mr. Bramley reports that about sixty pairs nested.

Mr. Bernard Brophy, of Leeds, sent me word that a Moorhen had hatched one clutch of eggs, and had laid a second clutch, in an old nest of the Magpie, to which she had added a few pieces of straw as a lining, at Burley-in-Wharfedale, and I visited the spot. The nest would be about thirty feet up in a sycamore in a small wood on a steep bank, and the nest would be quite seventy feet above the level of the river! It would be interesting to know how she got the young ones down?

The Stonechat certainly did not nest on Baildon Moor this year, nor apparently anywhere else in the West Riding. On April 11th I went to Malham with a young friend who was anxious to obtain some eggs of the Carrion Crow before the keepers shot at the old birds. He climbed to five new nests. Four were lined and almost ready for eggs, but only one contained eggs (three).

The Eshton Herony is still in Lord's Wood, and Captain J. H. Preston tells me that they are certainly increasing, and he is afraid that they are doing much damage. There must be well over twenty nests occupied now. The small herony at Hubberholme still continues.

A White Starling was shot at Malham Tarn. For two or three months this autumn an almost white House Sparrow was noticeable in Ilkley. It was presumably a bird of the year. Mr. F. H. Edmondson tells me that there has been an almost completely white Blackbird in Keighley for some little time.

East Riding (E. W. Wade):—Many birds died during the severe winter 1925-26, the mortality among Tits and Redwings being most marked.

The winter generally was dull and cold, with an absence of fine weather till April 1st-21st.

The early spring was exceptionally dry, having a marked effect upon the Rooks, which generally had small clutches, besides suffering from frosts in late March which destroyed many eggs. The other Corvidæ breeding after the fine weather in April commenced, were normal. Owls were late in breeding, and had only moderate clutches.

Owing to the dry weather in early spring, the marshy ground was quite dried up, driving away the usual breeding population of Snipe and Redshank.

The warm and sunny weather following a severe winter stimulated the breeding activities of many birds, resident and partially migratory. Meadow Pipit, Chaffinch, and Skylark were sitting by the third week in April; Redshank hatching in the first week of May.

After this followed three weeks of very cold weather. Migrants were curiously affected, some arriving very early and breeding before others of the same species had put in an appearance. On 8th May a Blackcap Warbler with five eggs was observed, though most of the species did not arrive till after that date, and Garden Warblers, caught

by the cold weather, disappeared and did not come again. Many birds, after building their nests, waited a fortnight before laying.

Swallows and Martins were more abundant than for many years, and after the cold weather passed, had a successful season, rearing three clutches of young before October. The temperature during summer was higher than the average, with sufficient rain to provide insect food. The fine weather during the migration period in early April no doubt was responsible for the increase in numbers, in striking contrast to 1925, when snowstorms prevailed over Europe. Swifts were not so numerous as in 1925, and were late in breeding. Many of them were going south on 11th August, and the last bird was seen on 19th September. There was a marked scarcity of Yellow Wagtail, Tree Pipit, Garden Warbler, Sedge Warbler, and Blackcap in this district.

The Spotted Flycatcher did not arrive till 5th June, about ten days later than the average, but was more numerous than usual.

Only seven Corncrakes were heard in this district. It is a pity this bird cannot be scheduled for protection throughout the year to stop the slaughter in the south on the autumn migration, as it is one of the most useful birds on the farm. The Whinchat and Goldfinch keep up their numbers. The Jay seems to be extending its range in Holderness; two were destroyed at Hornsea.

The game birds started laying early, and though many Partridge nests were destroyed by the deluge on 14th June, the season has been a good one, even on the Holderness clays.

A Grasshopper Warbler was in song at Ferriby on 12th May, but did not stay to breed.

A Sabine's Gull was seen by Mr. C. F. Procter in Bridlington Bay on 1st October.

The Gannets renewed their attempt to nest on Black Shelf at Bempton Cliffs, but the Kittiwakes carried off the nesting material as fast as it was deposited, and finally drove them away. The Kittiwake makes more inroads yearly into the nesting quarters of Guillemot and Razorbill. The Herring Gull also is on the increase and destroys many eggs. The Fulmar, on the other hand, seems for the time to be stationary in numbers. Many Guillemots have been destroyed by oil, proving that the three mile limit for discharge of oil refuse is ineffective, and Guillemots and Razorbill under these conditions are decreasing in numbers.

North Riding (W. J. Clarke) :—Stormy weather during the early part of the spring migration prevented many visitors being observed at the usual dates, and some winter visitors remained until late in the season. A Hooded Crow was noted at Scarborough* on May 31st, 1926, and several Swallows at Sleights on November 6th, 1925. A Swift was passing Whitby on October 26th, 1925.

Most species of Finches have been noted in their usual numbers. Small flocks of Siskins occurred near Whitby during the winter, but Bramblings were scarce all over the district. Greenfinches have again been somewhat more scarce than usual. Goldfinches have been not quite so abundant. Lesser Redpoles appear to be increasing. On December 18th, 1925, an example of Coves Redpole was taken.

Warblers turned up in about average numbers, the Sedge Warbler being rather more numerous than in past years. An adult Black Redstart was noted on November 1st, 1925. A Blue-throated Warbler was observed on November 15th, 1925. The bird remained all the winter, and was seen at frequent intervals up to September 19th, 1926. On June 28th, 1926, a British Willow Tit was obtained. Reed Buntings bred again at the Seamer Mere, but none were observed in the Whitby

* Scarborough is the locality of the other records unless otherwise stated.

district. The Corn Bunting does not regain its former numbers and still remains scarce, only two being noted. The pair of Yellow Wagtails which usually nests each year here did not turn up this year, and only a single example was noted at Whitby. Upon the moors, Curlews have slightly increased this year, but Golden Plovers were scarcer. A Grey Plover was shot at Whitby in October, 1925. Common Sandpipers have been decreasing in numbers for several years, and were scarce upon the streams in the district, most of those seen passing on to other districts. Several pairs of Woodcock nested in this area, and they have been numerous in the Whitby district. Landrails maintained the slight increase in their numbers observed last year. A number of pairs of Coot nested on the Seamer Mere, and many were seen at Whitby during the hard weather. A pair of Peregrine Falcons inhabited the cliffs on the coast for the greater part of the breeding season, but no evidence of nesting could be obtained. A Marsh Harrier was obtained near Robin Hood's Bay during the spring of 1926. The Little Gull has again appeared at Whitby, usually arriving in July and remaining until October. Sandwich Terns were frequently seen in the same area but not so often at Scarborough. Common and Arctic Terns were abundant upon passage. A Red-necked Grebe was noticed on the Seamer Mere from December 23rd to January 4th, 1926. Mallards appear to be increasing as a nesting species. Scoters have been absent all along the coast. Shags appeared in increased numbers at Whitby, their occurrences in other places being about the average of other years. Fulmars have frequented the cliffs all along the coast, nesting between Scarborough and Filey, but not in the Whitby district.

The recorder is indebted to Messrs. F. Snowden, of Whitby, and T. N. Roberts, of Scarborough, for much information contained in this report.

York District (S. H. Smith):—Species destructive to game are allowed more liberty to-day than ever before, and on this account observers may note Kestrel, Sparrowhawk, Carrion Crow, Magpie, Tawny Owl, Barn Owl and Long-eared Owl quite regularly in this area.

On Strensall Common at least four pairs of Curlew have successfully reared their young, and there is an increasing number of Mallard and Teal Ducks breeding at this place.

On Skipwith Common there is a big colony of Black-headed Gulls, apparently living in harmony with Mallard, Teal and Shoveller Ducks, and it was hoped that the Bittern would nest there this year. Unfortunately, one of these rare birds was killed by a dog on February 28th at Riccall, and this destroyed any chance there may have been during 1926.

At Castle Howard on March 29th a pair of Great Crested Grebes repaired its nest on the Lake, and on April 4th this nest contained five eggs. Another pair frequented the lake, but was not known to nest, and four young birds noticed on May 10th, no doubt belonged to the birds first observed.

Among the rarer winter visitors, a Waxwing was caught in the grounds of Walkington Hall, Beverley, by Mr. Edward Hodgson, on November 21st, 1925, and another Waxwing frequented the gardens of Hall Cottage, New Earswick, the residence of Dr. Gayner, for several weeks during that winter, and ultimately went safely away.

On March 5th a Great Bustard was picked up dead by Mr. S. Garbutt Islebeck Grauge, near Thirsk.

Nightjars appeared in their usual numbers in the York district, and have bred successfully at Sandburn, Barmby Moor, Kexby and Skipwith.

Turtle Doves have been noticed in all their usual haunts, and appear to maintain their numbers.

We have no record this year of the Stone Chat nesting on Strensall

Common, but a female of this species frequented the usual haunt during the whole of the spring, but the lack of a partner apparently prevented a nest being built.

Two nests of the Turtle Dove were discovered at Huggate on May 26th, and a nest of the Gold Crest containing young birds was found in the gardens at Aldersyde, York, on May 23rd.

Numbers of Goldfinches and Bullfinches have been seen, and this points to the good effect of the Wild Birds Protection Acts in checking the work of the bird-catcher.

On January 31st a male Hawfinch was picked up in the Exhibition Square, York, its head almost severed by contact with telegraph wire.

On March 25th a Kestrel Hawk was seen flying around the York Minster, and it was again reported the following day by one of the Vergers, who stated that he had seen it on several occasions previously.

At 2.30 a.m., March 26th, a pair of Barn Owls was seen flying from the direction of the Museum Gardens into the turret of the York Theatre Royal, where it has nested now for a number of years.

A Green Woodpecker frequented the grounds at West Mount, York, the residence of Mr. J. B. Morrell, during the winter 1925-26.

Several pairs of Dippers have nested along Crambe Beck and Isle Beck, and Kingfishers have been numerous at both these places, and a pair of Great Crested Grebes reared their young within three miles from the centre of the city.

An Albino Swallow (pure white variety) was seen at Snowfields Farm, and another at Watermill Farm, Alne, on September 13th.

ARRIVAL OF IMMIGRANT BIRDS.

Owing to the late spring and long periods of contrary winds and bad weather, the arrival of summer visiting birds was considerably impeded, and it is noticeable that large numbers must have perished during their sea passage to our coasts ; this applies particularly to the Spotted Flycatcher, which has practically disappeared in the York district during 1926.

March 27th, Chiff Chaff ; April 5th, Swallow ; April 7th, Willow Wren ; April 9th, House Martins, Cuckoo ; April 10th, Lesser Whitethroat ; April 11th, Sand Martins, Sandpiper ; April 12th, Blackcap Warbler ; April 18th, Yellow Wagtail, Common Whitethroat ; April 23rd, Garden Warbler, Redstart ; May 1st, Swift ; May 3rd, Landrail ; May 4th, Wood Warbler ; May 12th, Reed Warbler ; May 13th, Tree Pipit.

I must acknowledge the valuable help I have received in compiling these notes from Mr. V. G. F. Zimmerman, Dr. Gayner, Mr. H. Shorney, Mr. H. Sowden.

MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mammals (Sydney H. Smith) :—Badgers maintain their position in practically all their old haunts. Otters are also fairly numerous throughout the county, and on July 10th a young dog otter was killed in Swinegate, York, by a policeman early in the morning, and later exhibited in the office windows of *The Yorkshire Herald*.

The Porpoise has often been recorded at Naburn Lock, near York, evidently strays that have followed the Salmon up the river, a distance of eighty miles. On September 9th one was shot here ; it was 40 inches in length, and weighed 46 lbs.

The American Grey Squirrel is now common in the York district, to the disadvantage of the Red Squirrel. Mr. E. W. Wade reports that it has made its appearance at Houghton Woods, and that the Red Squirrel is in consequence becoming consistently scarcer.

A further report from Holderness by Mr. C. F. Procter, states that Hares are considerably more numerous this year than last, and that the Rabbit is everywhere.

Mr. H. B. Booth's notes draw attention to the occurrence of a Melanic Common Shrew obtained at Saddleworth early this year by Mr. F. J. Stubbs (*The Naturalist*, p. 157).

A very large dog Fox, killed near Ben Rhydding in January, was carefully weighed at $16\frac{3}{4}$ lbs., and Mr. Booth states that he hears of many Foxes that are 'guessed' to be of 20 lbs. weight, and suggests that it would be of interest if more of these large foxes were accurately weighed.

Mr. Ross Butterfield states that he has observed on the Leeds and Liverpool Canal, near Gargrave, what he is practically sure are Daubenton's Bats, but one has not yet been obtained.

Fishes :—Mr. Booth reports a large Eel as having been trapped in the reservoir at Farnley Hall, which measured 40 inches in length, but was not weighed. Another large Eel, $38\frac{1}{2}$ inches long, $7\frac{3}{4}$ inches girth, and weighing 4 lbs. 13 ozs. was caught on August 27th, 1926, by Mr. James Wood while fishing in a brick pond near Dringhouses, York. A still larger Eel, weighing 5 lbs. 4 ozs. was caught in the River Ouse, near Skelton Landing, by Captain W. Gascoyne in June, 1926. This Eel put up a tremendous fight, and was ultimately landed in the gallant captain's umbrella.

A fine Chub, weighing 6 lbs. 2 ozs. was caught in the River Nidd, near Moor Monkton, by Mr. Boyes, on June 26th, and has been preserved by the York Amalgamation of Anglers.

A Silver Bream, weighing 1 lb. 9 ozs., was caught in the River Derwent at Cottingwith by Mr. F. Wright on September 2nd, and a Grayling weighing $2\frac{1}{4}$ lbs. was caught at Ganton in the River Derwent during August by Mr. W. Davis, of Malton; this, of course, is not a record Grayling by any means, but is large for the River Derwent.

During 1926 many Stone Loach were caught in the River Ouse below York, an unusual locality.

Mr. Booth, on April 10th, saw large numbers of Grayling spawning on the shingle shallows of the River Wharfe, a few hundred yards below the Strid in Bolton Woods.

During the early part of the year I marked by means of small silver-numbered tablets, many Trout, Roach and Rudd, these marked fish being introduced into Barton Hill Beck, Isle Beck, near Thirsk, and the coarse fish into the River Ouse at York, and I should be obliged if anglers who should obtain any of these marked fish would give me details regarding their capture.

(*To be continued*).

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The Bird Book, by **Enid Blyton**. London: G. Newnes, Ltd., 124 pp., 3/6. Printed with large type and illustrated with charming coloured and black-and-white representations of our more familiar birds, this volume will particularly appeal to young naturalists, and should make an excellent gift book.

Nomenclator animalium generum et subgenerum, la. 4to, published by the **Prussian Academy of Sciences, Berlin**. By subscription till 31st March, 1927, at 13 Reich-marks per part, after that date 20 R.-m. The book will contain all the generic and subgeneric names given to animals between 1758 and 1920. It is expected to contain 200,000 references, and to run to twenty-five parts. Its value will be very great, as it will throw the entries in Agassiz, Marschall, Scudder, Waterhouse, and the 1900-1920 references in *The Entomological Record* into one index. The list of collaborators is formidable, and the printing appears to have been carefully edited.

YORKSHIRE NATURALISTS AT MIDDLEHAM.

F. A. MASON.

THE 330th meeting of the Union was held at Middleham during Bank Holiday week-end, July 31st—August 2nd. The gathering was small owing to the uncertainty of travel facilities due to the industrial difficulties of that period, but an exceedingly pleasant week-end was enjoyed by the visitors, which included members of most of the sections.

Under the guidance of Mr. J. Hartshorn, Saturday was devoted to a visit to Penn Hill and Carlton. Although the outline of Penn Hill, rising to an altitude of 1685 feet, is such a conspicuous feature of Wensleydale, this mountain is not often traversed by naturalists, and the present occasion gave a welcome opportunity for careful examination of its slopes. The motoring members of the party assisted in making a comparatively easy task of what would otherwise have been a very arduous day's work.

The Ure and the Cover occupied the attention of members on the following day, and the entomologists particularly found plenty to do. Thanks to our member, Mr. John Maughan, East Witton Fell and its plantations, which are models of British forestry, were visited on Monday under the guidance of the Rev. Canon Garrod. After lunch the ruins of Jervaulx Abbey were visited, during which a very interesting account of the abbey and the monastic life of its period was given by Canon Garrod.

During the whole of the week-end the charming gardens of Mr. Hugh Maughan were open to members, and most of the visitors availed themselves of Mr. Maughan's courtesy.

At a General Meeting held at Headquarters on Monday evening, under the chairmanship of the President (E. Hawksworth, Esq.), brief reports were received from Messrs. J. M. Brown, B.Sc., Greevz Fysher, J. Hartshorn, T. Ashton Lofthouse, and F. A. Mason, some of which appear below. Votes of thanks were unanimously accorded to Mr. J. Hartshorn (Local Secretary), the Rev. Canon Garrod, Mr. Hugh Maughan and Mr. Christie, of Jervaulx.

VERTEBRATE ZOOLOGY (W. G. Bramley) :—Little attention was given the birds at this unfavourable time of the year. Chaffinches were in larger numbers than are usually seen in a pastoral district. Of the typical moorland birds the Curlew, Dipper and Grey Wagtail were all observed, and on the river the Sandpiper was heard. Sand Martins were also numerous by the riverside, whilst Swallows and House Martins were fairly abundant. Amongst the woods Willow Wrens were common, but were more often seen than heard. A Brown Owl was disturbed in Coverdale, and feathers belonging to this species were picked up in many places.

Few of the other mammals, except the rabbit, were seen. The bats were represented by the Pipistrelle, which was numerous, as well as by the Noctule. Among the fishes, Trout were fairly abundant in both the Cover and Walden Beck.

MOLLUSCA (Greevz Fysher) :—Owing to the very fine weather, terrestrial species were far from abundant, but *Balea perversa*, as hinted by Mr. Taylor, was discovered in plenty between the loose stones at the top of the walls bounding the fields in the neighbourhood of Cover Bridge.

Much time was given to dredging in some sandy places on the River Ure between Middleham and the above named bridge.

The total list of Mollusca observed and submitted to Mr. John W. Taylor, M.Sc., is as follows :—

Limax maximus, *Helix aspersa* and var. *fasciata*, *Helicigona arbustorum*, immature; *Helicigona lapicida* var. *nigrescens*, Waldendale; *Hygromia rufescens*; *Ashfordia granulata*, immature; *Pyramidula rotundata*, scarce; *Pyramidula rupestris*, scarce; *Succinea elegans*, Aysgarth;

Planorbis nautilus var. *imbricata*, Darlington; *Ancylus fluviatilis*, River Cover; *Anodonta cygnea*, River Ure, Middleham; *Pisidium amnicum*, young very numerous); *Pisidium pusillum*, *nitidum*, *supinum*, *subtruncatum*, *casertanum* and *henslowana*.

HEMIPTERA (J. M. Brown, B.Sc.):—Considerable numbers of Hemiptera were taken, and as these insects do not seem to have been previously recorded from these dales, the complete list of those so far worked out is given.

HOMOPTERA.

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| <i>Philænus spumarius</i> L. Common. | <i>Deltoccephalus striatus</i> L. Coverdale. |
| f. <i>lineatus</i> Fab. | |
| f. <i>fasciatus</i> Fab. | <i>Limotettix lunulifrons</i> J. Sahlb. |
| f. <i>spumarius</i> L. | Caperby and Penn Hill. |
| f. <i>leucocephalus</i> Germ. | <i>L. persimilis</i> Edw. Bolton Woods |
| f. <i>lateralis</i> L. | and Coverdale. |
| f. <i>populi</i> Fab. | <i>L. sulphurella</i> Zett. Common. |
| <i>P. lineatus</i> L. Common. | var. <i>lutea</i> Edw. Coverdale. |
| <i>P. exclamationis</i> Thunb. Penn Hill and Coverdale. | <i>L. flaveola</i> Boh. East Witton Fell. |
| <i>Euacanthus interruptus</i> L. Penn Hill and Carlton Gill. | <i>Alebra albostriella</i> Fall. Coverdale. |
| <i>Batrachomorphus lanio</i> L. Cover Bridge. | <i>Dikraneura similis</i> Edw. Coverdale. |
| <i>Oncopsis alni</i> Schr. Common. | <i>Eupteryx auratus</i> L. Redmire (M.L.T.), Leyburn. |
| <i>Acoccephalus nervosus</i> Schr. Coverdale. | <i>E. stachydearum</i> Hdy. Leyburn. |
| <i>A. bifasciatus</i> L. Penn Hill. | <i>E. germari</i> Zett. Witton Fell and Leyburn. |
| <i>Athysanus obsoletus</i> Kbm. Witton Fell and Penn Hill. | <i>E. pulchellum</i> Fall. Leyburn. |
| var. <i>piceus</i> Scott. Coverdale. | <i>Typhlocyba nitidula</i> Fab. Coverdale. |
| <i>A. sordidus</i> Zett. Coverdale. | <i>T. douglasi</i> Edw. Carlton Gill and Leyburn. |
| <i>A. brevipennis</i> Kbm. Penn Hill. | <i>Conomelus limbatus</i> Fab. Caperby and Witton Fell. |
| <i>Deltoccephalus distinguendus</i> Flor. Common. | <i>Dicranotropis hamata</i> Boh. Coverdale. |
| <i>D. pulicaris</i> Fall. Common. | <i>Rhinocola ericae</i> Curt. Penn Hill. |
| <i>D. abdominalis</i> Fab. Carlton Gill. | <i>Psylla crataegi</i> Schr. Witton Fell. |
| <i>D. pascuellus</i> Fall. Coverdale. | <i>P. perigrina</i> Forst. Coverdale. |
| <i>D. punctum</i> Flor. Coverdale, and the rare long-winged form, Penn Hill. | <i>P. nigrata</i> Zett. Carlton Gill. |
| | <i>Trioza urticæ</i> L. Common. |

HETEROPTERA.

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| <i>Nabis limbatus</i> Dahlb. Penn Hill. | <i>Phytocoris tiliæ</i> F. Cover Bridge. |
| <i>N. flavomarginatus</i> Schultz. Penn Hill. | <i>P. dimidiatus</i> Kb. Cover Bridge. |
| <i>Anthocoris confusus</i> Reut. Redmire (M.L.T.), Coverdale. | <i>P. pini</i> Kb. Leyburn Shawl. |
| <i>A. nemorum</i> L. Leyburn. | <i>P. ulmi</i> L. Redmire (M.L.T.). |
| <i>Tetraphleps bicuspis</i> H.S. Leyburn Shawl. | <i>Calocoris sex-guttatus</i> F. Common. |
| <i>Acompororis pygmæus</i> Fall. Leyburn. | <i>C. norvegicus</i> Gmel. Common. |
| <i>Pithanus mærkeli</i> H.S. Common. | <i>Lygus pabulinus</i> L. Very common. |
| <i>Stenodema holsatum</i> F. Penn Hill. | <i>L. viridis</i> Fall. Cover Bridge. |
| <i>Trigonotylus ruficornis</i> Four. Carlton Gill and Coverdale. | <i>L. contaminatus</i> Fall. Coverdale. |
| <i>Teratocoris saundersi</i> D. and S. Bolton Woods. | <i>Camptozygum pinastri</i> Fall. Witton Fell. |
| <i>Miris ferrugatus</i> Fall. Penn Hill and Coverdale. | <i>Dicyphus errans</i> Wolff. Bolton Woods. |
| | <i>Campyloneura virgula</i> H.S. Witton Fell. |
| | <i>Blepharidopterus angulatus</i> Fall. Witton Fell and Leyburn. |

<i>Mecomma ambulans</i> Fall. Redmire (M.L.T.), Leyburn.	<i>P. alnicola</i> . Redmire (M.L.T.), Coverdale.
<i>Orthotylus marginalis</i> Reut. Redmire (M.L.T.), Leyburn, Bolton Woods and Witton Fell.	<i>Plagiognathus chrysanthemi</i> Wolff. Redmire (M.L.T.), Carlton Gill, and Coverdale.
<i>O. viridinervis</i> Kb. Witton Fell and Leyburn.	<i>P. arbustorum</i> F. Common.
<i>Malacocoris chlorizans</i> Fall. Coverdale.	<i>Gerris lateralis</i> var. <i>costae</i> H.S. Penn Hill.
<i>Psallus betuleti</i> Fall. Leyburn Shawl.	<i>Velia currens</i> F. Penn Hill.
<i>P. variabilis</i> Fall. Coverdale.	<i>Salda saltatoria</i> L. Redmire (M.L.T.)
<i>P. varians</i> H.S. Coverdale and Leyburn.	<i>S. scotica</i> Curt. Redmire (M.L.T.) Aysgarth.

PLANT GALLS (J. M. Brown, B.Sc.):—Three members of the Galls Committee were present, and a fair number of galled plants were noticed, but the galls found were mostly common forms, perhaps the most interesting being that taken by Mr. Mason on *Hieracium sylvaticum*, due to *Aulacidea hieraci*, from which Miss Pilkington finds a number of very small flies are emerging, probably inquilines.

The following list of galled plants and the gall-formers was compiled :

PLANT.	GALL-FORMS.
<i>Pteris aquilina</i>	galled by <i>Anthomyia signata</i> .
<i>Nardus stricta</i>	" <i>Epichloe typhina</i> .
<i>Dactylis glomerata</i>	" <i>Eriophyes tenuis</i> .
<i>Salix</i> sp.	" <i>Pontania salicis</i> and <i>P. proxima</i> .
<i>Alnus rotundifolia</i>	" <i>Eriophyes laevis</i> and <i>E. nalepaei</i> .
<i>Ulmus campestris</i>	" <i>Schizoneura ulmi</i> .
<i>Urtica dioica</i>	" <i>Perrisia urticae</i> .
<i>Lychnis dioica</i>	" <i>Contarinia Steini</i> .
<i>Spiraea Ulmaria</i>	" <i>Perrisia ulmariae</i> .
<i>Poterium sanguisorba</i>	" <i>Eriophyes sanguisorbae</i> .
<i>Rosa canina</i>	" <i>Rhodites eglanteriae</i> and <i>R. rosae</i> .
<i>Pyrus Aucuparia</i>	" <i>Eriophyes pyri</i> .
<i>Crataegus monogyna</i>	" <i>Perrisia crataegi</i> .
<i>Trifolium repens</i>	" <i>Perrisia trifolii</i> .
<i>Vicia cracca</i>	" <i>Contarinia craccae</i> .
<i>Acer pseudo-platanus</i>	" <i>Phyllocoptes acericola</i> and <i>Eriophyes macrochelus</i> .
<i>Helianthemum Chamæcistus</i>	" <i>Contarinia helianthemi</i> .
<i>Fraxinus excelsior</i>	" <i>Phyllocoptes fraxini</i> .
<i>Veronica Chamædrys</i>	" <i>Perrisia veronicae</i> .
<i>Galium saxatile</i>	" <i>Eriophyes galioibius</i> .
<i>Sambucus nigra</i>	" <i>Epitrimerus trilobus</i> .
<i>Solidago virgaurea</i>	" <i>Macrosiphum solidaginis</i> .
<i>Senecio Jacobæa</i>	" <i>Stictodiplosis Jacobæa</i> .
<i>Hieracium sylvaticum</i>	" <i>Aulacidea hieraci</i> .

A specimen of Larch was noticed on the Leyburn Shawl, on which practically all the cones were double. This peculiarity may have been due to a parasite, but it was doubtful whether this was the case.

Mr. M. L. Thompson reports the following beetles were met with on the banks of the Ure at Redmire :—

<i>Bombidium litorale</i> Oliv. (<i>paludosum</i> Panz.).	<i>Longitarsus membranaceus</i> Foud.
<i>B. saxatile</i> Gyll.	<i>Allodactylus affinis</i> Payk (<i>geranii</i> Payk.).
<i>B. atro violaceum</i> Duf. (<i>stomooides</i> Dej.).	<i>Anaspis geoffroyi</i> Mull.
<i>Philonthus ventralis</i> Grav.	<i>Orchesia minor</i> Walk. (<i>tetratoma</i> Thoms.).
<i>Ægialia sabuleti</i> Payk.	

FIELD NOTES.

Ptinus tectus Boield at Slaithwaite.—Specimens of this beetle, obtained from a stuffed rabbit, and given to me by Mr. A. Dean, are apparently the first local record of this species. I am indebted to Mr. M. L. Thompson for its identification.—W. E. L. WATTAM, Newsome.

The Grey Phalarope near Pickering.—On the 16th November, 1926, I received from Mr. J. Green, of Thornton-le-Dale, a dead bird for identification. Mr. Green is well acquainted with the birds of his district, but does not remember having seen this species previously. From its toes, lobed like those of the coot, I knew it must be a Phalarope, and after a careful examination, felt certain it was the larger species, the Grey Phalarope, in winter plumage. But in order that there might be no doubt about its identity, I forwarded the specimen to Mr. T. Sheppard, M.Sc., and he confirmed my decision. It measured in length, so far as I could determine, just $8\frac{3}{8}$ in., which is $\frac{1}{8}$ in. longer than the figure given in the books. The bird had been found by a young workman on the roadside, between Thornton-le-Dale and Kingthorpe. Evidently it had died of hunger, being very thin, and little else but skin and feathers. From its state of decomposition I should say it had been dead two or three weeks. About five years ago I saw what I feel sure was a Grey Phalarope inland near Bridlington, on the thawed margin of a frozen pond between the fox covert at Carnaby and the farm at Auburn. Its tameness appeared remarkable, for it allowed me to approach within two or three yards, and then moved only a yard or two away. To make it fly from the pond, I had to throw some mud and turf, and even then it made only a short circular flight of a few seconds' duration. As a result of the pond being covered with a thin sheet of ice, the bird confined its attention to the edges where the ice had melted. I examined carefully the impressions of its toes in the soft mud, and they showed distinctly the enlargement due to the lobes. At the time I reported the incident to the late Thos. Audas, of Bridlington, but he considered the record required further investigation. So, on the following day, his son, Mr. William Audas, and I visited the pond. The bird, however, had disappeared, but the marks of its toes in the mud could easily be recognised. A year or two later, I saw a Phalarope perching on the stern of a fishing coble, in Bridlington harbour, when an old fisherman aptly described it as 'one of them shore birds that swims.' Nelson, in 'The Birds of Yorkshire,' stated that the Grey Phalarope is an occasional visitant in autumn and winter, and of rare and uncertain occurrence. Since 1861 he gives ten records of its having been found at inland localities.—R. J. FLINTOFF, Goathland, North Yorks., 1st December, 1926.

A CONTRIBUTION TO THE ARACHNIDAL FAUNA OF MID-WALES.

WM. FALCONER, F.E.S.

Both in North and South Wales visiting and resident naturalists have collected spiders for scientific purposes. In some instances they have published the results of their investigations, and in others forwarded their captures to competent authorities, who have incidentally noted in general papers the rarer kinds, but not the commoner ones, the names of which, however, are not lost, but preserved in private records for possible further use. Mid-Wales, on the other hand, has been very little favoured by arachnologists, and published records are practically non-existent. Hence the present paper.

Some years ago Mr. W. P. Winter sent me a number of arachnids from the neighbourhood of Aberystwyth, collected by him when on holiday there in August and September, 1911. I also spent a fortnight in the same district in July, 1925, but only in a few instances did the ground covered coincide with his. With both, also, collecting was a secondary consideration, and no doubt more systematic and earnest search would have added considerably to the sixty-eight species of spiders, seven of harvestmen, two of false scorpions, and four of mites which we together obtained. The most noteworthy finds were *Robertus neglectus* Cb., *Floronia frenata* Wid., *Cercidia prominens* Westr., *Oxyptila sanctuaria* Cb., and *Nothocyba subaequalis* Westr. Mr. Winter's species are distinguished by his initials; the uninitialled ones are my own.

SPIDERS.

Amaurobius similis Bl. Old walls, Aberystwyth.
Oonops pulcher Templ. Sandhills, Aberdovey.

Zelotes apricorum L. K.

Z. latreillei C.L.K. Spiders of this genus swarmed among the heaps of shingly stones on the sea embankment south of the harbour, but in this situation, owing to their remarkable agility, with avenues of escape in every direction, it was almost impossible to secure examples, to state their relative abundance.

Theridion sisyphium Clerck. Llanilar, both sexes.

T. ovatum Clerck. and its variety *redimita* Koch. Spun up in leaves with its egg sacs in all the localities visited.

T. bimaculatum Linn. Aberdovey Sandhills, both sexes.

Robertus lividus Bl. Devil's Bridge to Hafod, male and female, W.P.W.
R. neglectus Cb. Pen Dinas, male, W.P.W., widespread, but not common.

Pholcomma gibbum Westr. Tan-y-Bwlch, female, W.P.W. Llyfnant Valley, females.

Maso sundevallii Westr. Ystwyth Valley, female.

Ceratinella brevis Wid. Lake Talyllyn, male.

Ceratinella brevipes Westr. Devil's Bridge to Hafod, females, W.P.W.

- Pocadicnemis pumila* Bl. Aberayron, females.
Aræoncus humilis Bl. Ystwyth Valley, female.
Dicymbium nigrum Bl. Wallog, male, W.P.W.
Wideria antica Bl. Wallog and Devil's Bridge to Hafod, males, W.P.W.
Neriene rubens Bl. Tan-y-Bwlch, and Devil's Bridge to Hafod, females, W.P.W. Cwm Woods and Lake Talyllyn, females.
Dismodicus bifrons Bl. Aberayron, female.
Nothocyba subæqualis Westr. Wallog, female.
Aulacocyba subitanæ Cb. In a barn, Lover's Lane, Constitution Hill.
Erigone dentipalpis Wid. Pen Dinas, female.
Edothorax retusus Westr. Wallog, W.P.W. Cwm Woods, males.
E. fuscus Bl. Pen Dinas and Wallog, W.P.W. Aberystwyth, both sexes.
E. agrestis Bl. Tan-y-Bwlch, male, W.P.W.
Halorates reprobus Cb. Aberystwyth, south beach, male, W.P.W.
Oreonetides abnormis Bl. Llyfnant Valley, female.
Peciloneta globosa Wid. Devil's Bridge to Hafod, two males, W.P.W.
Leptyphantes zimmermannii Berth. Tan-y-Bwlch and near Devil's Bridge, W.P.W. Cwm Woods, both sexes.
L. leprosus Ohl. Clarach Valley, female, W.P.W.
L. minutus Bl. Clarach Valley, both sexes, W.P.W.
Drapetisca socialis Sund. Cwm Woods, on tree trunks.
Linyphia triangularis Clerck. Cwm Woods, Llanilar and Llyfnant Valley.
L. clathrata Sund. Tan-y-Bwlch and Devil's Bridge to Hafod, W.P.W.
L. peltata Wid. Cwm Woods.
Stemonyphantes lineata Linn. Tan-y-Bwlch, W.P.W. Ystwyth Valley.
Bolyphantes luteolus Bl. Devil's Bridge to Hafod, W.P.W. Parson's Bridge.
Floronia frenata Wid. Clarach Valley, female, W.P.W. Apparently the first mention for Wales.
Tapinopa longidens Wid. Devil's Bridge to Hafod, female, W.P.W.
Pachygnatha degeerii Sund. Tan-y-Bwlch and Devil's Bridge to Hafod, both sexes, W.P.W. Aberdovey, Lake Talyllyn, Llyfnant Valley, Constitution Hill and Pen Dinas.
P. clerckii Sund. Aberayron, females.
Meta segmentata Clerck. General amongst vegetation.
M. merianæ Scop. Llanilar and Llyfnant Valley.
Zilla x-notata Clerck. Aberystwyth.
Cercidia prominens Westr. Traethsaith, July, 1914, an immature male, W.P.W., mainly southern with a few northern records, but not common.
Epeira diademata Clerck. Pen Dinas.
E. pyramidata Clerck. Pen Dinas, male, W.P.W.
E. quadrata Clerck. Pen Dinas, females, W.P.W. and W.F.
Ero furcata Vill. Tan-y-Bwlch and Devil's Bridge to Hafod, W.P.W. Llyfnant Valley, females.
Oxyptila sanctuaria Cb. Clarach Valley, male, W.P.W. An uncommon spider, mainly southern in its range.
Clubiona reclusa Cb. Llyfnant Valley and Ystwyth Valley, females, spun up in curled-up leaves with egg sacs.
C. comta C.L.K. Llyfnant Valley, female.
Cælotes atropos Walck. Llyfnant Valley, under stones with young.
Argyroneta aquatica Latr. South beach, Aberystwyth, W.P.W., two females.
Tegenaria atrica C.L.K. South Beach, Aberystwyth, male, W.P.W.
T. derhamii Scop. The common house spider, in the town.
Textrix denticulata Oliv. Amongst shingle on sea embankment south of the town. Also abundant and very agile, but more easily taken if found in their slight silken cells than *Zelotes*, which see above.

- Agelena labyrinthica* Clerck. Clarach Valley, W.P.W.
Antistea elegans C.L.K. Wallog, female, W.P.W.
Hahnia montana Bl. Lake Talyllyn, male, and Llyfnant Valley, both sexes.
Pisaura mirabilis Clerck. Pen Dinas, female, W.P.W.
Trochosa terricola Thor. Devil's Bridge to Hafod, male, W.P.W. Ystwyth Valley, female.
T. picta Hahn. Wallog, W.P.W. Aberdovey Sandhills, females.
Lycosa amentata Clerck. Aberayron, females.
L. pullata Clerck. Devil's Bridge to Hafod, female, W.P.W. Ystwyth Valley, females.
L. agricola Thor. Wallog, female, W.P.W.
Euophrys frontalis Walck. Aberdovey, plentiful beneath stones in a quarry.
Heliophanus flavipes C.L.K. On the banks of the Ystwyth, females.

HARVESTMEN.

- Nemastoma lugubre* Müll. Aberdovey, Lake Talyllyn, Llyfnant Valley, Cwm Woods, Aberayron, both sexes.
Mitopus morio Fabr. Llyfnant Valley, Cwm Woods, Ystwyth Valley, both sexes.
Oligolophus agrestis Meade. Tan-y-Bwlch and Devil's Bridge, W.P.W. Lake Talyllyn, Aberdovey, Llyfnant Valley, Cwm Woods, plentiful.
O. tridens C.L.K. Devil's Bridge to Hafod, W.P.W. Aberayron, two females.
Lacinius ephippiatus C.L.K. Devil's Bridge to Hafod, W.P.W. Near Altwen.
Phalangium opilio Linn. Aberdovey, Lake Talyllyn, Cwm Woods and Pen Dinas, both sexes.
Liobunum rotundum Latr. Tan-y-Bwlch and near Devil's Bridge, W.P.W. Llyfnant Valley, Cwm Woods, Ystwyth Valley, Aberayron, plentiful in most of the localities.

FALSE SCORPIANS.

- Obisium muscorum* Leach. Tan-y-Bwlch, one example, W.P.W.
Chthonius rayi L.K. As the last.

MITES.

- Achorolophus norvegicus* Sig. Thor. Aberdovey, several examples.
Belaustium minutum Herm. Yspytty Cynfyn, one example.
Bdella longirostris Herm. Constitution Hill, one example.
Gamasus coleoptroratorum Linn. Nymphs on the beetle *Geotrupes stercorarius*.

— : o : —

The Wild Animals of Australasia, embracing the mammals of New Guinea and the Nearer Pacific Islands, by **A. S. Le Souef** and **Harry Burrell**, with a chapter on the Bats of Australia and New Guinea, by **E. Le G. Troughton**. London: G. G. Harrap & Co., Ltd., 388 pp., 25/- net. Students of the fauna of this large continent, in securing facts for the study of the extraordinary series of vertebrate life there to be found, will welcome this remarkably complete monograph, dealing not only with the mammals of Australia itself, but with those of New Guinea and the Inner Pacific Islands. These include the Marsupials, of which a wonderful set of photographs is given. There are over a hundred reproductions from photographs, and among these are Echidna; Platypus; Marsupial Mole; Grey Pouched Mouse; Native Cat with Young in Pouch; Tasmanian Devil; Marsupial Wolf; Short-nosed Bandicoot; Western Rabbit-Bandicoot; Koala, or Native Bear; Phalangers; Opossums; Kangaroo; Wallaby; Jerboa-Rats; Fruit-Bats, etc. The monograph is exceptionally well produced, and can be recommended to zoologists.

REVIEWS AND BOOK NOTICES.

Microscopic Fresh Water Life, by F. J. W. Plaskitt. London : Chapman & Hall, xi.+278 pp., 13/- net. After a series of Introductory Chapters giving practical hints on collecting microscopic forms of pond life, with details of suitable localities, the author has chapters dealing with Algae ; Diatoms ; Desmids ; Infusoria ; Bryozoa or Moss Animalcules ; Entomostraca ; Water Mites ; Water Bear, and other organisms. The Water Mites are described by Mr. C. D. Soar, who gives excellent illustrations, already made familiar to readers of *The Naturalist* from the contributions of the late Mr. George, of Kirton Lindsey. Photographs sketches and diagrams, to the number of about 300, assist in making this volume particularly useful to microscopists.

Wild Flowers of the Cape, by A. Handel Hamer. Oxford : Basil Blackwell, Ltd., 104 pp., 21/- net. The floral wonders of South Africa are frequently commented upon, but this book, with its charming coloured plates, and its sketches in the margins, probably will give as excellent an idea of the unusual forms of plant life to be met with in Cape Colony as can be expected at its comparatively low price. There are a dozen coloured plates by Ethel Driscoll, and seventy-nine line drawings by Dorothy Levyns, and every species referred to is illustrated in the text.

H.M. Geological Survey has issued an interesting memoir dealing with an interesting area, namely **The Geology of Berwick-on-Tweed, Norham and Scremerston**, by A. Fowler (iv.+58 pp., 1/6 net), the illustrations to which graphically describe the foldings and crumplings which are so well shown in that area. The memoir includes descriptions of the Carboniferous Rocks, including the Tuedian and Bernician ; Faults ; Glacial and Post-Glacial Deposits, and in addition there is an excellent series of details of borings, and a bibliography. The memoir is in illustration of Sheets 1 and 2, Norham and Berwick-on-Tweed, both solid and drift editions of which have been published at two shillings each.

Nearly 3000 pages of the second section of **Index Animalium**, prepared by Mr. C. Davies Sherborn, have been printed off, Part XI., containing the words '*funereus* to *gyzehensis*' (1801-1850, pp. 2569-2880), having recently appeared.

The Old Stag, by H. Williamson. London : G. P. Putnam's Sons, Ltd., 298 pp., 7/6 net. Under this title Mr. Williamson brings together a series of very readable stories likely to be of interest to our readers. The subjects vary and deal with such items as No Eel nor Nog ; The Flight of the Pale Pink Pyjamas ; The Yellow Boots ; The Old Pond ; and the Five Lives of the Isle-of-Wight Parson.

Ways of Living : Nature and Man, edited by J. Arthur Thomson. London : Hodder & Stoughton, 246 pp., 3/6 net. Anything written or published by Professor Thomson is well worth perusing, and in addition to his papers on 'Each for Himself,' and 'Social Animals' ; the volume contains 'Individualist Plants and Parasitic Plants,' by Dr. Macgregor Skene ; 'Parasitic Animals,' by Dr. John Rennie ; 'Communities and Partnership among Plants,' by Dr. A. S. Watt ; 'Man and Nature,' by Dr. R. D. Lockhart ; and 'Envoy,' by Professor P. Geddes.

The Memory Factor in Biology, by C. J. Patten. London : Bailliere, Tindall & Cox., xiii.+175 pp., 5/- net. Professor Patten produces still another work in which he recounts first hand many of his own experiences relating to memory activities in the lower animals, his chapters being on The Rise and Enthronement of Dualism ; Monism and Psychic Gradations ; Ontogeny and Phylogeny ; The Physical Basis of Memory ; The Memory Rhythm in Evolution ; Memory and Heredity ; Conscious Memory ; Conscious Memory in the Child and Lower Animals ; Instinct and Reason ; and Memory and Education.

CORRESPONDENCE.

ARTIFICIAL DISTRIBUTION OF MOLLUSCA

Permit me to reply to Professor Boycott : The specimens of sinistral *Limnaea peregra* received from Mr. J. A. Hargreaves, of Leeds, were placed in what I considered to be a most suitable local pond, the exact locality of which I communicated to Mr. Hargreaves and also to Professor Boycott himself ; then, having duly recorded the same in the Conchological Record Book of the Scarborough Field Naturalists' Society, I thought I had given the matter sufficient attention and publicity for the time being. The specimens collected by Alderman Bean, simply labelled 'Scarborough,' are now in the local museum.—W. GYNGELL.

—:o:—

NEWS FROM THE MAGAZINES.

An excellent leading article on 'Science and the Press' appears in *Nature*, No. 2978.

'G.W.L.' reviews Coleman's 'The Ages : Recent and Ancient' in *The Geographical Journal* for November.

The Marquess of Tavistock describes the Queen of Bavaria's Conure in *The Avicultural Magazine* for December.

Dr. H. S. Harrison has an interesting paper on 'The Origin of the Socketed Bronze Celt' in *Man* for December.

Illustrated notes on 'Parsnip Canker,' and 'Poisonous Plants on the Farm,' occur in *The Journal of the Ministry of Agriculture* for December.

'Details of the Breeding Habits of the Lapwing,' by R. H. Brown ; and 'Fledging Periods of some British Birds,' by T. G. Longstaff and F. C. R. Jourdain, appear in *British Birds* for December.

W. J. Arkell continues his studies among 'the Corallian Lamellibranch Fauna of Oxford, Berks., and Wilts.,' in which Yorkshire specimens are figured and described, in *The Geological Magazine* for December.

The Bryologist, the Journal of the Sullivant Moss Society, Volume XXIX., No. 5, contains an article by our contributor, James Murray, on 'Mounting Mosses as Microscopic Slides,' which should be useful to collectors and microscopists.

The Irish Naturalists' Journal for November has a paper on the Irish Stoat, which, naturally enough, begins 'The Stoat is the animal known all over Ireland as the Weasel—the true Weasel, so common in England, being a stranger to this country.' The same Journal contains a drawing of 'The Adventures of Running Sap,' which is certainly one of the most extraordinary illustrations we have ever seen in a scientific publication.

The New Phytologist, Vol. XXV., No. 4, contains a continuation of Professor J. H. Priestley's researches on 'Light upon Growth' ; a further chapter on 'Mycorrhiza,' by M. C. Rayner ; 'Parasitism in the Genus Comandra,' by E. H. Moss ; 'The Form of the Protoplast in Cells of the Genus Ceranium and those of *Dasya coccinea*,' by R. W. Phillips ; and 'Notes on the Theory of the Solid Carpel and Carpel Polymorphism,' by Edith R. Saunders. The publication is as well printed and as well illustrated as usual.

According to *The Journal of Genetics*, Dr. Heslop Harrison 'finds that, in interspecific crosses between *T. crepuscularia* \times *T. bistortata*, melanism, introduced by the latter, remains, as it does within the limits of a species, a Mendelian recessive ; that the progeny carrying two female characters ($\text{♀} \text{♀}$) out of a *bistortata* (female) \times *crepuscularia* (male) mating are non-viable ; that in back-crosses between *bistortata* ($\text{♀} \text{♀}$) and the two possible of the F_1 generation carrying two male characters ($\text{♂} \text{♂}$), one half of the $\text{♀} \text{♀}$ dies ; and that in the reciprocal *crepuscularia* ($\text{♀} \text{♀}$) \times *bistortata* ($\text{♂} \text{♂}$) crosses, the sex-ratio among the offspring is undisturbed.'

NORTHERN NEWS.

Mr. J. W. Stather has been elected President of the Yorkshire Geological Society.

Sir Alfred Yarrow has given £10,000 towards the funds of the British Association for the Advancement of Science.

A Porbeagle, 4 ft. 6 in. long, caught near the Chickens Lighthouse ; and a Sunfish from the same locality, together with a Crustacean known as *Penella orthagorisci*, attached to the Sunfish, have been added to the collections in the Manx Museum.

The British Museum (Natural History) continues to issue its useful sets of postcards, the latest illustrating Crystals, in two series, each containing five cards of beautiful reproductions in colours of typical crystals, together with a six-page descriptive leaflet. Another is a second series of 'Famous Naturalists,' which includes one card printed in colour and eight in monochrome, together with an interesting eight-page pamphlet relating to the portraits of the following naturalists : Sir Hans Sloane, Sir Joseph Banks, John Evelyn, Antony van Leeuwenhoek, G. J. Mendel, Richard Pulteney, Albert Seba, George Shaw, Sir James E. Smith. Each packet is sold at one shilling.

—:o:—

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

The Editor of the *Proceedings of the Isle of Wight Natural History Society* is to be congratulated on the sixth part of the volume, which is full of valuable articles dealing with local geology, mollusca, plant remains, etc. There are also useful meteorological notes and short natural history records, the whole going a long way to make a permanent and valuable natural history record of the Island.

We have received *The British Bryological Society's Report* for 1926, which contains the various reports of the Distributors, etc. ; of the Annual Meeting ; a List of Bryological publications issued during the year ; and 'Note on *Helicodontium pulvinatum* Lindb.' by C. H. Brinstead ; and European Varieties of *Zygodon viridissimus*. Students of the distribution of Mosses and Hepaticas will find the records in the extensive distribution reports of particular value.

The Transactions of the Liverpool Biological Society, Vol. XL., have been issued, and contain No. XXVII. of the well-known L.M.B.C. Memoirs, this one dealing with *Aphrodite aculeata*, the Polychaet worm, usually known as the 'sea mouse.' The memoir is by M. G. C. Fordham, Lecturer in Zoology at the University of Liverpool. It is accompanied by an excellent series of plates. In addition, the report contains Mr. W. S. Laverock's Presidential Address on 'Biology and our Public Museums' ; The Marine Biological Station at Port Erin, being the Thirty-ninth Annual Report ; and Report on the Investigations carried out during 1925 at the Sea Fisheries Laboratory in the University of Liverpool.

The Proceedings of the Yorkshire Geological Society for 1926 contain Professor E. J. Garwood's excellent Presidential Address on 'Some Problems of River Development' ; and the following papers : 'The Pleistocene Mammalia of the British Isles and their Bearing upon the Date of the Glacial Period,' by M. A. C. Hinton ; 'The Petrography of the Carstone and Associated Beds in Yorkshire and Lincolnshire,' by H. C. Versey and C. Carter ; 'The Glaciation of Wensleydale, Swaledale, and adjacent parts of the Pennines,' by A. Raistrick ; 'The Carboniferous Sequence of the Craven Lowlands south of the Reef Limestones of Cracoe,' by Kathleen M. Booker and R. G. S. Hudson ; and 'Bibliography of Yorkshire Geology, 1925,' by T. Sheppard.

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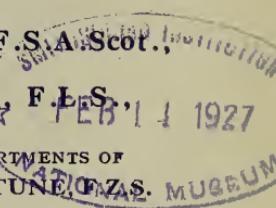
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YORKSHIRE NATURALISTS' UNION.

VERTEBRATE SECTION.

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Two Meetings will be held in the Library of the Leeds Philosophical Society on Saturday, February 19th, 1927, at 3-15 p.m. and 6-30 p.m.

Papers will be given as follows:—

- ‘The Meaning of Colour in Birds’ Eggs and Young’ (illustrated),
by E. W. Wade.
- ‘The Wolf in Yorkshire,’ by W. G. Bramley.

In view of the short programme, members are particularly invited to bring notes, specimens and lantern slides.

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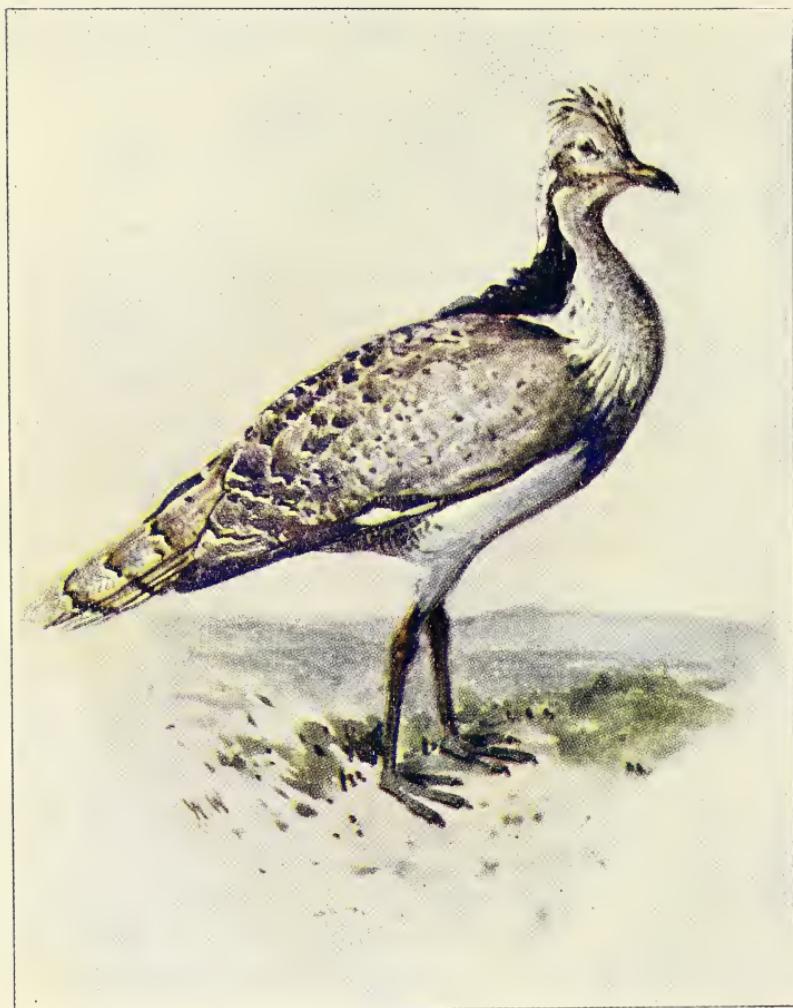
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NOTES AND COMMENTS.

THE PALÆONTOGRAPHICAL SOCIETY.

Just in time to be included in the 1926 bibliographies and lists, Volume LXXVIII. of the Palæontographical Society's monographs, for 1924, has been published. It contains three important monographs—one on 'The Gault Ammonites,' by Dr. L. F. Spath; 'The Upper Eocene Flora of Hordle,' by Miss M. E. J. Chandler; and a third on 'The Macrurous Crustacea of England,' by Mr. Henry Woods. This last contains illustrations and descriptions of many interesting species from the Speeton Clay of Speeton, and the Lias of Whitby, which are preserved in East Yorkshire Museums, the National Collection, or in private hands.

MOUNTSORREL ROCKS.

The Director of the Museum at Leicester, who also has charge of the Art Gallery and Public Libraries there, still seems to have the time as well as the ability to devote himself to research work, and the Literary and Philosophical Society at Leicester has just published his monograph on 'The Igneous Rocks of the Mountsorrel District: Their relationship to each other and to the Charnwood Forest Area,'* which was the thesis enabling him to get his degree of Doctor of Philosophy in the University of London. Dr. Lowe divides his treatise into five parts, dealing with The Granite of the Main Mass; The Disconnected Masses at Swithland Reservoir and Brazil Wood; The Melange at Kinchley; The Dykes, Veins and Inclusions; The Geological History of the Intrusion and its relation to the Charnwood Forest Area. There is a sketch map of the district, a list of the literature on the subject, and, what will appeal particularly to petrologists, no fewer than twenty-nine blocks from photographs of thin slices of the various rock-types. These are unusually well done, and appear on plates at the end of the volume.

EDIBLE AND POISONOUS FUNGI.

The question as to which Fungi are edible and which are poisonous is constantly occurring, and the Ministry of Agriculture and Fisheries has prepared a pamphlet on the subject.† This contains twenty-five coloured plates excellently prepared, illustrating the principal edible and poisonous species. The Glutinous agaric (*Volvaria gloiocephala*) occurs, not very commonly, on the ground among grass, on rubbish heaps. It is specially referred to because in general form it resembles species of the genus *Amanitopsis*, which are edible, but it

* By E. E. Lowe. London: T. Murby & Co., 1 Fleet Lane, E.C.4, 50 pp. and 18 plates. 6/6.

† 'Miscellaneous Publications,' No. 54, 28 pp., 2/6 net post free.

may be at once distinguished by the glutinous cap and the pinkish colour of the gills when mature. *V. gloiocephala* and its allies have always been regarded as poisonous, but there is recent evidence that they may be eaten without ill-effects. They cannot be recommended as good.

LIVERPOOL GEOLOGISTS.

A record of the Sixty-seventh Session of *The Liverpool Geological Society* appears in its *Proceedings* recently published,



Fig. 1.—**View looking north**, showing peaty sand above the 'Peat and Forest.' Bed, which is underlain by estuarine and marine deposits of grey sand and blue clay. Since 1910, when this was taken, the dunes have been much reduced in height, and, together with the platform of Peat, etc., have been cut back by marine erosion.

edited by Mr. C. B. Travis (Part III., Vol. XIV., pp. 197-283), and printed in the familiar pink cover. In addition to an interesting account of the Society's activities and the awards of its medal, it contains 'A Tour in the Swiss Alps,' by E. Montag; 'The Keuper Basement Beds of Wirral,' by T. A. Jones; 'Notes on the Characters and Classification of Pyroclastic Rocks,' by H. Williams; 'The Petrography of the Triassic Rocks of the Vale of Clwyd,' by I. S. Double; 'The Peat and Forest Bed of the South-west Lancashire Coast,' by C. B. Travis; and 'The Petrographic Features of Keuper Rocks from a boring at Wilmslow, near Stockport, Cheshire,' by Stella West Alty.

CHESHIRE PEAT.

We are glad to see that a large proportion of the papers

deals with the area of the Society's activities, and in view of investigations which are now being made among the peat beds of the country, Mr. Travis' article is of particular value at the present moment. The number of species of plants given as a result of the examination by Dr. Erdtman is extraordinarily large, and we believe contains references to species not previously recorded in the peat. We are permitted to reproduce two illustrations which accompany Mr. Travis' paper.



Fig. 2.—**View looking south**, showing a broad tract of the 'Peat and Forest' Bed (with numerous stools of trees), underlain by laminated blue clay. (Photo., Sept., 1925.)

DECAY OF STONEWORK.

H.M. Stationery Office has issued a 'Memorandum on the Defective Condition of the Stonework at the Houses of Parliament and Proposals for its Restoration.* When we bear in mind the elaborate investigations which were made in connexion with the selection of suitable stone for the erection of the Houses of Parliament, as a result of the findings of a Commission, the extraordinary results of weathering as shown in this memorandum is almost unbelievable. After a considerable research, Bolsover Moor stone was eventually used at the commencement, but as time went on it was found impossible to obtain blocks of sufficient size, and the same difficulty having been experienced in connexion with stone from a quarry at Mansfield Woodhouse, the Commissioners finally

* 50 pp., 1/3 net.

chose a stone from Anston, in Yorkshire, although its quarry defects were well known. This report deals in detail with the results of these defects, and the methods of repairing and restoring the structure. A series of illustrations from photographs is also given, showing the damage to the stonework, from which it would appear that Anston stone certainly was not particularly suitable for the London atmosphere.

EARLY AMATEUR BOTANISTS.

At a recent meeting of the Linnean Society of London, Mr. J. Ramsbottom gave an account of the Society of Amateur Botanists. Mordecai Cubitt Cooke (1825-1914) was appointed headmaster of the new Trinity School, Lambeth, at the age of 23. Here he conducted evening botanical classes under the old Science and Art Department. In the later 'fifties he occasionally took his pupils for country rambles. Subsequently they were joined by outsiders, and in 1860 constituted themselves into the Society of Amateur Botanists. This was planned for excursions, interchange of specimens, communication of papers, and the establishment of a library, herbarium, and museum. Cooke was the first and only President. Excursions were held on alternate Saturdays, and meetings on alternate Wednesdays. At one time the society numbered about fifty, and among the members and those who attended the meetings were Jas. Britten, Thistleton Dyer, W. W. Newbould, Berthold Seemann, Worthington G. Smith, and Henry Trimen. Some of the papers read at the meetings were published in *The Journal of Botany* or in the ephemeral *Botanists' Chronicle*. The meetings were held first at the Metropolitan Club, Edgware Road, and then over the shop in Piccadilly of Robert Hardwicke, the publisher of natural history works. The formation of *Hardwicke's Science Gossip* was described, and the manner in which a letter in the first volume (1865), from W. Gibson, suggesting an association of amateur microscopists something on the plan of the Society of Amateur Botanists, led to the formation of the Quekett Microscopical Club. The new club enrolled 155 members in its first year. Excursions were carried out as with the Society of Amateur Botanists, many of whose members joined the new club. The Society languished, and may be said to have been killed by the Quekett.

THE PHOENIX.

The British Museum (Natural History) has issued a Calendar for 1927, giving details of the building, hours of opening, recent additions, details of the staff, etc. There is a reproduction of a quaint illustration of 'The Phoenix,' with the following description taken from *Hortus Sanitatis* (*Tractatus de Avibus*, Capitulum XLVIII.) published in 1491,

which is in the Library of the Museum :—‘ The Phœnix is an Arabian bird, so called either because its colour is Phœnician purple, or because in the whole world it is singular and unique. For Phoenix is the Arab word for singular and unique. After living for fifty years and more, as soon as it sees that it has grown old it builds itself a pyre of aromatic sticks of its gathering, and turning towards the rays of the sun it fans the fire of its own accord with the beating and flapping of its wings, and so it once more rises from the ashes.’ Ambrosius, Bk. V., ‘ The Phœnix, when it sees the end of its life to be at hand, builds itself a receptacle of frankincense and myrrh and other odorous spices, and when the span of life is accomplished it goes inside and dies ; and from the humours of its flesh a worm arises and gradually grows up and in the process of its growth after a certain time acquires feathers and wings, so that it is restored to the form and feature of the former bird, Therefore let this bird by its example teach us to believe in the Resurrection because, having neither example nor precept of reason, it renews for itself the outward act of the Resurrection.’

—:o:—

Interesting statistics, as well as general information, occur in the ‘ Reports of H.M. Inspectors of Mines for the Year 1925—2, Northern Division, by T. Greenland Davies’ (H.M. Stationery Office, 68 pp., 1/- net). The Northern Division includes the counties of Northumberland, Durham, Cumberland, Westmorland, the North Riding of the County of York, the detached part of Lancaster north of Morecambe Bay, and the Isle of Man. It produces coal, ironstone and iron ore, lead ore, barytes, zinc ore, gypsum, fluor spar and other minerals. There are reports on various accidents in the mines, explosives used, and so on.

We have received from H.M. Stationery Office *The Fifth Annual Report of the Secretary for Mines* for the year ended 31st December, 1925, and *The Annual Report of H.M. Inspector of Mines* for the same period, with Statistical Appendix to both Reports (212 pp., 6/- net). This contains an extraordinary amount of detailed information relating to the various mines in the country, classified under the nature of the minerals, counties, etc. In addition to its ordinary work of gathering together statistics, the Department of Mines has an interest in the Miners’ Welfare Committee, Safety in Mines Research, Education and other miscellaneous matters.

Among the many interesting contents of *The Transactions of the British Mycological Society*, issued in December, we notice ‘ The Life-History of a Fungus Parasitic on *Antirrhinum majus*, with some remarks on the genus *Heterosphaeria*,’ by W. Buddin and E. M. Wakefield ; ‘ *Cryptotheciaceæ*,’ by A. Lorrain Smith ; ‘ The Genus *Ligniera* M. and T.,’ by W. R. I. Cook ; ‘ Notes on a Pycnidial Fungus associated with a Dying-Back of Apple Branches,’ by E. A. Southee and F. T. Brooks ; ‘ The Inheritance of spore size in *Coprinus sterquilinus*,’ by W. F. Hanna ; ‘ *Rhacophyllum* B. and Br.,’ and ‘ Studies in Entomogenous Fungi,’ both by T. Petch ; ‘ On a New Species of *Urophlyctis* producing Galls on *Lotus corniculatus* Linn.,’ by A. W. Bartlett ; ‘ Note on *Botryodiplodia* sp. on *Choisya ternata* in England,’ by R. C. Woodward ; and ‘ On two species of *Tolyposporium* Woronin recorded on cultivated Sorghum,’ by E. W. Mason.

FIELD NOTES.

Gannet Inland in Yorkshire.—Some time during the week ending December 18th, a Gannet was shot at Addingham, Yorkshire, in mistake for a wild goose. The bird was identified by Mr. H. B. Booth and myself.—G. DE P. VEALE, Ilkley.

Pine Marten near Sheffield.—A young female Marten was caught on the Broomhead Estate, Bolsterstone, near Sheffield, in the Ewden Valley, on July 30th last. Mr. R. H. Rimington Wilson, of Broomhead Hall, confirms this record, and adds further details. ‘She was in beautiful condition, colour dark brown, white patch under chin. Length 26 in. from nose to tip of tail; tail 8 in.’ The specimen will be added to the collection at Broomhead Hall.—CHARLES MOSLEY, The Museum, Huddersfield.

Viviparus contectus v. zebra Stenz.—In *The Naturalist* for September, 1926, page 283, Mr. John W. Taylor records a bandless form of *V. contectus* from Kanger See, near Antingziem, Kurland, Latvia, specimens in the Hull Museum (Hans Schlesch collection), collected by Mr. Harald Peterson in Riga, as var. *zebra* Stenz. Dr. F. Haas, Senckenberg Museum, Frankfurt-on-Main, kindly sent me co-types of the genuine var. *zebra* from Constantinople, and I was struck by the difference. As var. *zebra* is remarkable for the characteristic numerous light and dark transverse growth-lines, and of a dark colour, our Latvian form of a greenish colour possesses only as many growth-lines as the typical form of *V. contectus*, but differs only in being bandless (var. *efasciata* Pickering), and the epidermis mostly has been largely lost or exfoliated from the dorsal parts of the shell, when the shells appear of a crystalline white colour. I have, however, recently, through the kindness of Mr. Harald Peterson, obtained a number of this form, and find that all juvenile specimens have the greenish colour of epidermis, hence possibly the loss of epidermis on dorsal parts in full-grown specimens is caused by strong running water with sand particles—the Kanger See form is only var. *efasciata* Pickering!—HANS SCHLESCH.

Vivipara contecta var. zebra Stenz.—Referring to Mr. Schlesch’s communication upon the var. *zebra*, which was first described and well figured nigh upon fifty years ago by the late Dr. Wilhelm Kobelt, of Frankfort (*Rossmässler’s Iconographie*, Vol. V., p. 74, Pl. 138, fig. 1370), and is well represented by the Latvian specimens in my possession, kindly given to me by Mr. Schlesch. The finding of other specimens, which are more strongly marked, spirally banded, or with more numerous zebrial markings, does not invalidate or supersede the original description, but are to be regarded as subvarieties.—JOHN W. TAYLOR, December 21st, 1926.

PEAT DEPOSITS OF THE CLEVELAND HILLS.

G. ERDTMAN,
Stockholm.

THE peat beds of the Cleveland Hills may be sub-divided into two groups according to their geographical situation, viz. :—

1. VALLEY PEAT.—This includes peat found in the normal valleys of the district, such as Kildale (map, fig. 1), and the peat that occurs in the higher reaches of streams rising on the moorlands, such as Collier Gill. Another variety may be termed 'slack peat.' This occurs in the deserted

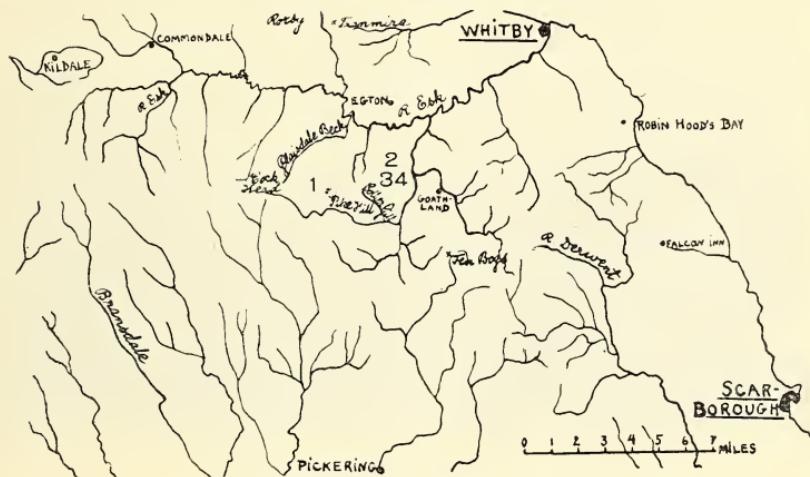


Fig. 1.—Localities mentioned in the Text.

1 = Yarlsley Moss ; 2 = Lady Bridge Slack and Moss Swang ; 3 = Purse Dyke Slack ; 4 = Randay Mere.

glacial-lake overflow channels of the Ice Age, usually known as ' slacks,' in North-eastern Yorkshire.

2. HILL PEAT.—This kind of peat has a very wide distribution, especially on the comparatively flat central watershed between the drainage of the Esk and the Derwent. It coalesces with the valley peat at the head of such valleys as Collier Gill.

As an example of valley peat the Kildale Peat Moss, four miles west of Commondale, and 575 feet above O.D., ought to be mentioned (fig. 2). This is a typical moss with the centre slightly higher than the margins. The surface vegetation comprises *Sphagnum cespitosum* and *Calluna vulgaris* as dominants, with a slight diffusion of *Eriophorum vaginatum*. Intermingled with these are *Drosera rotundifolia*,

Erica tetralix, *Nardus stricta*, *Narthecium ossifragum*, *Potentilla tormentilla*, and scanty patches of ill-grown *Vaccinium myrtillus*. Towards the margins of the moss, the ground is drier and grasses come in, such as *Deschampsia flexuosa*, *Molinia coerulea*, etc.

A record of nine borings in the Kildale Moss has been published in *Proc. Cleveland Naturalists' Field Club* (Hawell, Fowler, and Huntington, 1913). On 14th July, 1925, Mr. F. Elgee and I visited the Moss and made a boring at a central point south of the Commodity—Kildale railway.



Fig. 2.—The Kildale Peat Moss.

STRATIFICATION :

A.—425 cm. **cotton -grass -peat**, especially in the lower parts not quite typical; remains of pine at the base.

B.—85 cm. **birch forest peat**, with seeds of *Menyanthes* and radicells of *Equisetum*.

C.—45 cm. **muddy detritus**, with seeds of *Menyanthes*.

D.—35 cm. + **clay**, grey, sandy.

The diagram, fig. 3, visualises the composition of the fossil tree-pollen flora according to the results of micro-analyses of peat samples from the bore. In the layers B and C only pollen grains of *Betula*, *Pinus*, *Salix*, and *Corylus* are met with. The pollen frequency (the absolute number of pollen grains in a sq. cm. of a preparation) is very low, ranging from six in sample 25 to seventy-five in sample 18. In sample 26 only six birch pollen grains and two and a half pine pollen grains were noted. However, layers of detritus, such as layer C, are usually very rich in pollen, because they

are an excellent preservative for them. Thus it seems probable that the forests in the neighbourhood of Kildale were very scanty if they existed at all when layer C was formed.

Willow pollen is frequent only beneath the niveau of sample 17, the frequency increasing towards the base (maximum 53 per cent. in sample 25). Pollen of oak and elm occurs in samples 17 and 16 and upwards; pollen of lime in sample 14 to sample 7. I have calculated the frequency of the *Corylus* pollen separately (also that of *Salix*), and expressed it as a percentage of the total of forest tree pollen. It is noteworthy that this pollen in most cases shows its maximum

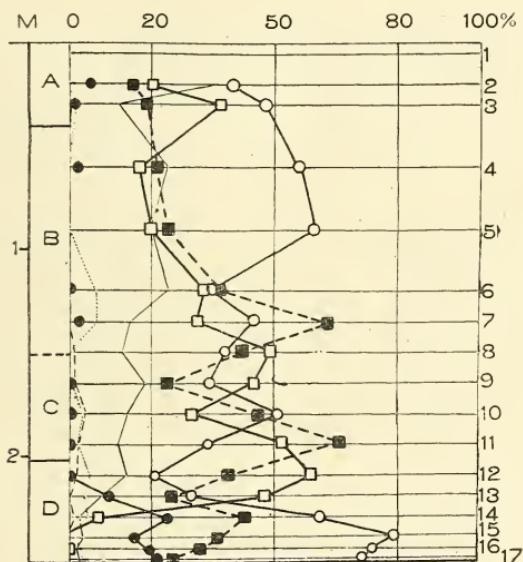


Fig. 3.—Pollen-diagram from Kildale Peat Moss.

—□— *Alnus*. —○— *Betula*. —●— *Pinus*. *Ulmus*.
 ——— *Quercus*. - - - - *Tilia*. - - ■ - *Corylus*.
 ▲ *Fagus*. ◇ *Salix*.

The horizontal scale gives the percentage for the various forest trees (indicated by signs as shown). The vertical scale shows, on the right, the numbers under which the successive samples are recorded; on the left, the depth in metres, from which the samples were taken, as well as the different strata (A=cotton-grass-peat, B=birch forest- peat, C=muddy-detritus, D=clay).

frequency soon after its first appearance (sample 17, 142 per cent.). A moss near Goathland (diagram, fig. 5) exhibits the same feature. The pine pollen frequency rapidly decreases after the hazel pollen maximum, while the alder pollen frequency shows as rapid an increase. In its younger layers

the Kildale Moss is practically of the same type as Chat Moss, west of Manchester, of which the registration of the development of the Lancashire forests is briefly dealt with in *The Journal of Botany*, March, 1926.

The Slack peat occupies the bottoms of the glacial lake overflow channels, where, owing to the slight fall, water accumulates and peat consequently forms. The slack peat occurs at varying altitudes. The highest slack is not more than 1000 feet. It is found in Ewe Crag Slack (Elgee, 1912, pp., 115-119); Newton Dale at Fen Bogs (where there is some true 'fen' as well as moss vegetation); Randay Mere (G. B. Williams in *Proc. Inst. C. E.*, Vol. CXXXVII., p. 357, 1899) and Moss Swang (Goathland); Tramire Slack and Roxby Peat Holes in North Cleveland; and some slacks near Robin Hood's Bay and Staintondale.

The head of Lady Bridge Slack (Murk Mere Moor, Egton) is a vast *Juncus* swamp, chiefly *J. conglomeratus*. Where this species ceases to be dominant *Calluna* and *Eriophorum vaginatum* come in and prevail to the lower reaches of the slack. At the bottom of the slack *Erica tetralix* and *Calluna vulgaris* were co-dominant in 1913 on the old slightly sloping Swidden ('Swiddens' are spaces which have been burnt and over which plant life re-establishes itself). *Polytrichum* and *Sphagnum* formed the ground vegetation, and on these mosses, the cranberry (*Vaccinium Oxyccoccus*) was abundant all over the swidden. The slopes of the slack are covered with a pure *Callunetum* with patches of *Pteridium* at the watershed.

In Ewe Crag Slack the greatest depth, $21\frac{1}{2}$ feet, was recorded at a point where the peat moss slopes up stream as well as down (Kendall, 1902). At the head of Purse Dyke Slack the peat is about 4 feet thick with stools of birch on the floor. Remains of pine have been observed in the slack called Foulzyke, near Robin Hood's Bay (Kendall and Wroot, I., 1924, p. 616). A single boring in a central part of Randay Mere showed:—

A.—210 cm. *Sphagnum* peat, not very typical, much decayed.

B.—255 cm. forest peat with traces of *Phragmites* at about 300 cm. beneath the surface.

C.—10 cm. + clay, grey, with black radicells penetrating from layer B.

Three samples from the base of the forest peat showed (B=*Betula*, P=*Pinus*, C=*Corylus*):

448 cm. beneath the surface: 96% B, 4% P; 15% C.

457 cm. beneath the surface: 98% B, 2% P; 7% C.

462 cm. beneath the surface: 96% B, 4% P; (2% C?).

These analyses show that peat was forming here before

the immigration of the alder, but not as early as when the oldest layers of the Kildale Moss were built. The birch pollen must be over-represented, because the peat was most probably formed in a birch carr.

Hill peat is extensively developed on the central watershed. The surface vegetation consists here almost exclusively of *Eriophorum vaginatum* and *Calluna*, the former sometimes preponderating, though never to the exclusion of *Calluna*.

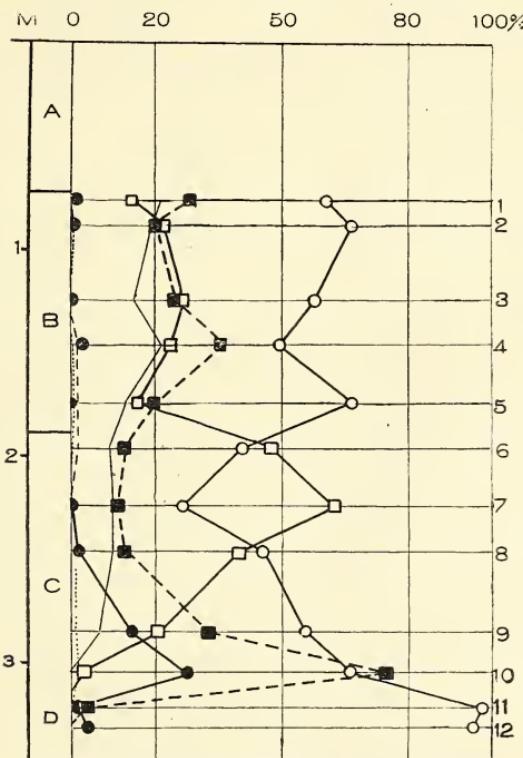


Fig. 4—Pollen-diagram from Peat at Collier Gill.

For explanation of signs, see fig. 3, p. 41.

A *Sphagnum* peat with *Calluna*; B = *Eriophorum vaginatum*-peat; C=d : with remains of birch; D=Birch forest peat.

No tree remains have been observed in Pike Hill and Yarlsey Mosses at the heads of Egton Grange and Glaisdale at about 1070 feet altitude. Where Pike Hill Moss falls down to Collier Gill birch remains, however, are frequent in the peat cuttings between 800 and 900 feet. Yarlsey Moss blends with a large peat area round the head-waters of Bluewath Beck. Here, south and east of Cock Head, at 1250 feet, the peat is nearly six feet thick, chiefly composed of *Sphagnum*. A little lower

downstream the peat is from 6 to 8 feet thick with a well-defined birch zone about two feet from the rock bottom. Still further down-stream the birch zone seems to run out, and stools of birch and rowan occur on the rock floor.

From the Harwood Dale Bog (standing by the Whitby and Scarborough highroad near Falcon Inn), Miss Whitaker (1921) has described :

- A.—A top layer, about 10 feet with *Sphagnum, Eriophorum vaginatum*, ericaceous plants, etc.
- B.—A forest layer, about 4 feet, with twigs, stools and roots of trees (over hundred annual rings were counted from some of the pine stumps); also pine cones and hazel nuts.
- C.—A fen layer, from a few inches to 2 feet, with *Scirpus, Juncus, Phragmites*, etc.

A sample from 180 cm. below the surface at Pike Hill Moss showed 42% *Betula*, 34% *Alnus*, 19% *Quercus*, 3% *Ulmus*, 2% *Pinus*, 38% *Corylus*. Also in the very bottom layer (bottom, stone and gravel, at 196 cm. beneath the surface) pollen of *Alnus*, *Betula*, *Quercus* and *Corylus* were present. The greatest part of the waste hill peat areas of the Cleveland Hills ought, like this peat, to be comparatively young, formed during or after the immigration of the alder. The peats are most likely of about the same age as the cotton-grass peat in the Southern Pennines (Woodhead and Erdtman, 1926), which may be dated as post-Tardenois and in which Neolithic and Bronze Age implements, etc., have been found.

A diagram illustrating the character of the peat at Collier Gill is shown in fig 4. Especially with reference to the fairly well-developed pine pollen curve at the base, this deposit seems to be older than that of Pike Hill. Fig. 5 gives an idea of the fossil tree pollen flora of hill peat near Goathland Church. A layer of cotton-grass peat covers a forest peat stratum which rests on rock. Just at the boring place, however, there was some muddy material at the base, occupying a shallow hollow in the rock. The material in such places is, as indicated by the diagram, older than the hill peat proper, and later on they have, at a period of intensive peat formation, been covered, and thus connected with each other by a uniform cloak of forest and cotton-grass peat.

If the Cleveland peat deposits, as well as other British peats, were surveyed hydrographically and stratigraphically by modern methods of research, we could obtain the key to a more detailed knowledge of the Post-arctic changes of climate and also a conception of some of the chief causes which have influenced the history of the forests.

In conclusion, I wish to record my indebtedness to Mr. F. Elgee, of the Dorman Museum, Middlesbrough, and of

Commondale. Most of what I have said in this paper which does not directly deal with pollen statistics has been quoted

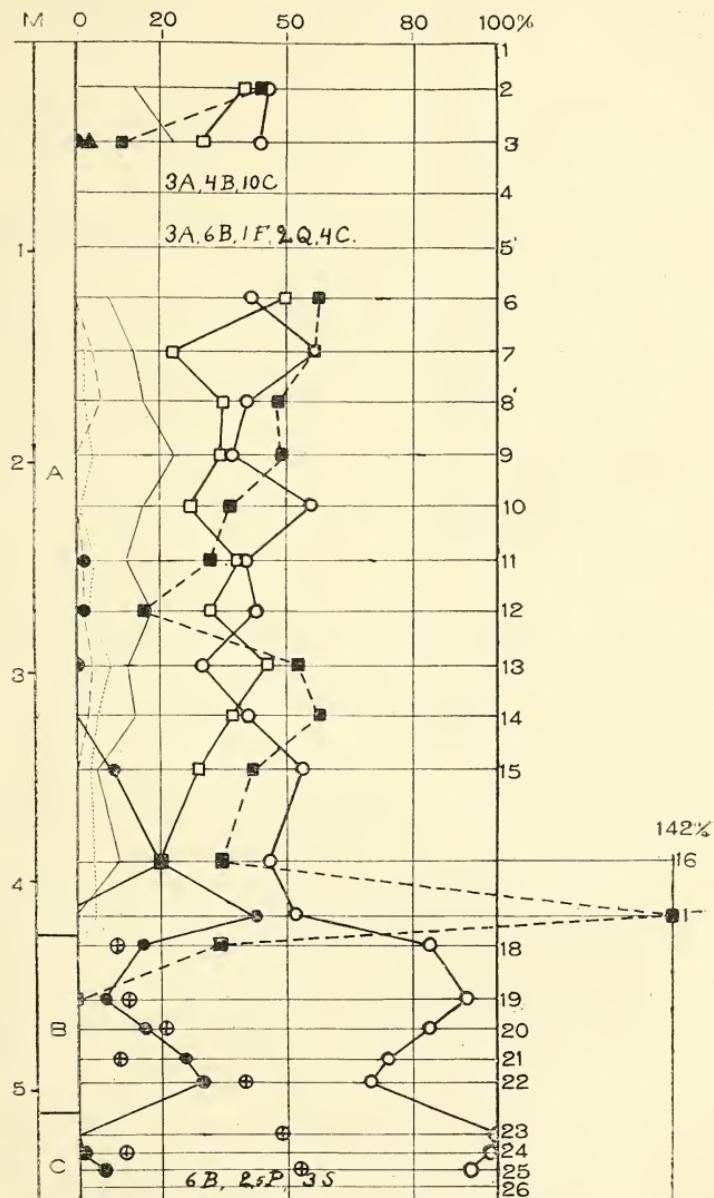


Fig. 5.—Pollen-diagram from hill peat south of Goathland Church.

For explanation of signs, see fig. 3, p. 41.

A=Sandy Clay; B=*Eriophorum vaginatum*-peat; C=Forest peat.

from Mr. Elgee's manuscript notes. He also conducted me to the Kildale Moss and has revised the English of this paper. The photograph, p. 40, was taken by Paul Keller, Zürich, whom I thank for help in my field work during our stay in Cleveland.

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Practical Bee-keeping, by Isaac Hopkins. Messrs. Whitcombe and Tombs, Christchurch, New Zealand, xvii.+288 pp., 6/6. By the aid of 150 illustrations the author has produced a sixth edition of this well-known manual of Australasian Bees. Practically every aspect of bee-keeping and methods of dealing with honey, wax, etc., are referred to in this volume.

Bird-Song and New Zealand Song Birds, by Johannes C. Andersen. Messrs. Whitcombe and Tombs, Christchurch, New Zealand, 215 pp., 25/-. Mr. Andersen gives an interesting account of the songs of the various New Zealand birds, which, in most cases, he has endeavoured to set to music. The birds are classified under 'fly-catchers,' 'warblers,' 'thrushes,' 'starlings,' 'larks,' etc. Illustrations are given of their favourite haunts, and there are several illustrations of double nests and nests with double linings, others showing variation in the eggs, and so on. Those interested in birds and their songs generally, or in New Zealand species in particular, will find this volume of value.

Numismatic Notes, Edited by Thomas Sheppard, M.Sc., F.G.S. (Hull Museum Publications, No. 140), 30 pp. The appearance of this small pamphlet is a welcome sign of the attention that is now being paid to Numismatics in the larger provincial museums. The editor has rightly collected for publication notes on matters of local interest. It is often just the little detail as the fact that Edward I. established his mint in a house in the High Street of his town of 'Kyngeston,' that will arrest the attention of the casual visitor to a museum. Probably the most important article is that which describes the hoard of pennies of Edward I. and II. from Scotton, near Knaresborough. It is especially satisfactory to note the intelligent and public-spirited manner in which the matter was treated by the finder and local authorities. The notes on medals and tokens will doubtless prove of interest to the specialists on these subjects.—C. C. OMAN.

A YORKSHIRE MACQUEEN'S BUSTARD.

IN Nelson's 'Birds of Yorkshire,' it is stated: 'This handsome Bustard, known also as the Asiatic Houbara and Ruffed Bustard, is resident in the Aralo-Caspian region, and winters in north-western India. It is a very rare accidental straggler to this country, only four instances being recorded, two of which belong to Yorkshire.'

The first Yorkshire example was a male, obtained at Marske-by-the-Sea in October, 1892, and it was purchased for the Newcastle Museum.

The other is referred to in the volume mentioned, as under: 'The second Yorkshire specimen, a young male, was seen at Kilnsea, near Spurn, on 17th October, 1896, and was fired at by Col. White, but, apparently, not injured. On the following day it was observed by Messrs. W. Eagle Clarke and H. F. Witherby, who watched it for some time through powerful binoculars at a distance of a hundred and fifty yards. On the wing it looked like a large Owl, and was mobbed by small birds; when it alighted behind a high bank, the Grey Crows hovered about it and so revealed the place where it was; it flew low, and slowly, skimming the ground. In walking it carried the head and neck like a feeding Pheasant, and appeared to spend its time in feeding, washing and preening itself. It walked in a stately fashion, but not with head upright, though when alarmed it stood with head and neck erect and on the alert, the long black feathers on each side of the neck being very conspicuous. It was fired at several times, and on being flushed never flew to a great distance, going about a hundred yards and then alighting, being eventually killed by Craggs Clubley. The bird weighed 3 lbs. 11 ozs.; its stomach was filled with vegetable matter, chiefly heads of ragwort and fragments of beetles. A peculiarity of the plumage was that the base of the feathers on the back and breast was, for about a fourth of their length, salmon pink, as also was the down. Mr. W. Eagle Clarke and the late J. Cordeaux dined off the body, and found the flesh dark and tender, in taste like a Wild Goose, with a savour of Grouse. This specimen is now in the possession of Col. White, of Hedon (*Zool.*, 1896, p. 433; and *Nat.* 1896, p. 323). It will be remarked that both these Houbaras were so tame, or unsophisticated, as to allow a shooter to approach within range.'

Colonel White has recently presented this specimen to the Municipal Museum at Hull, and informs me that in addition to those mentioned, the late Dr. H. Bendelack Hewetson was present on the occasion. The accompanying illustration is from a water-colour drawing by Mr. Woodhouse, and re-

presents the Marske example, though it might equally well have been drawn from the Spurn specimen (Plate II.).—T.S.

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The Fisheries Board for Scotland continues to print its practical memoirs, which are of great economic, as well as scientific, importance. The last published deals with Salmon Investigations in Scotland, 1923. **II., Salmon of the River Spey**, by W. J. M. Menzies and P. R. C. Macfarlane (H.M. Stationery Office, 120 George Street, Edinburgh, 36 pp., 3/6 net), with diagrams and enlarged photographs of salmon scales; and the second refers to Haddock Biology. **III., Metabolism of Haddock and other Gadoid Fish in the Aquarium**, by H. Thompson (H.M.S.O., 14 pp., 2/6). This has a remarkable series of illustrations of enlargements of the scales of fish, showing the zones, illustrating the difference between those formed in the sea and those formed in the Nigg Aquarium, Aberdeen.

If a wrapper helps to sell a book, certainly that around **Wild Animals of Yesterday and To-day**, by Frank Finn (London : S. W. Partridge & Co., 3/6 net), should ensure a ready sale for this volume of 200 cardboard-like pages, dedicated to Alfred Ezra. The wrapper shows a tiger with his left paw on the neck of a negro, whose head is surely shortly to disappear! The frontispiece illustrates a lion's deathbed, where a lion under a tree is having an argument with a lot of patient jackals. We are informed that 'his last days are rendered miserable by the skulking brutes which eagerly await his end.' There is a picture of the Dutchmen's Dodo Hunt, where these animals are being slain by men with sticks. Another is of a poor Himalayan bear apparently dancing to a ravenous pack of wild dogs, and so on; but these are not by the author. His chapters deal with Beasts Extinct in Prehistoric Times; Beasts Extinct in Historic Times; Extinct Birds and Reptiles; Animals' Foes and Rivals of Man; and Animal Allies. They are written in a way which only Frank Finn can write.

Dr. F. H. Herrick provides an interesting introduction to **Delineations of Americian Scenery and Character**, by J. J. Audubon (London : Simpkin, Marshall, Hamilton, Kent & Co., xlix.+349 pp., 18/- net), which contains charming narratives of nearly a century ago, which are now well-produced, and will be welcomed by British as well as American naturalists. Audubon's work needs no recommendation, and his writings breath the atmosphere in which he lived. The Prairie; Pole-cat; Deer Hunting; Wolves; Wild Horses; Raccoons; Turtles; are all dealt with, as well as fisheries, human inhabitants, and others. The book is well printed and produced.

The Primitive Races of Mankind, by Max Schmidt. London : G. G. Harrap and Co., 360 pp., 21/- net. This comprehensive manual, by a Professor of the University of Berlin, has been translated by Alexander K. Dallas, of Edinburgh, puts forward the main problems of Ethnology, and describes and illustrates the most important facts relating thereto. While the author may have had the needs of students in his mind, there is no doubt that his masterly treatise will bring it before many others. His illustrations are particularly apt, and in many cases admirably convey present-day aspects of conditions which probably existed in this country in prehistoric times; especially noteworthy in this direction being illustrations of milling flour on the Guinea Coast; a Pile Village on the Admiralty Islands; South American Dug-out canoes, and Looms of the Greenwich Islanders. The first section of the book deals with General and Systematic Ethnology, and the second with Special or Descriptive Ethnology (Ethnography). The peoples of different parts of the world are reviewed, and their peculiarities outlined, and the book is considerably increased in value by its wealth of maps, illustrations from photographs and sketches.

SIXTY-FIVE YEARS OF YORKSHIRE GEOLOGY.

E. HAWKESWORTH.

(Continued from page 14).

3. ECONOMIC.—In the economic development of our county, Geology has played a prominent part. The forecasts of the easterly extension of the coalfield, under rocks newer than Carboniferous, were all based on geological observation and data. This extension has been proved by the sinking of many large collieries, turning out large quantities of coal, whilst others are in progress. Up to about the middle of the last century coal-mining was practically restricted to the country lying west of the Permian escarpment, and, apart from various observations made and published by the Yorkshire Geological Society, and the knowledge gained from workings then in existence, little was known of the Geology of the Yorkshire Coalfield, until 1878, when the memoir of the Geological Survey on 'The Geology of the Yorkshire Coalfield' was published. Most of this was written by Professor A. H. Green, the first Professor in what is now the University of Leeds, and a past-president of this Union, whose memory is still cherished by all who knew him as a man of genial manner and high attainments. The alarmist arguments of Professor Jevons, in 1865, aroused the Government to appoint a Royal Commission, in 1871, to investigate the probability of certain of our coalfields being continuous under newer rocks, at a workable depth. The conclusions were mostly favourable, but none of the distinguished geologists who tendered evidence was inclined, or able, to give a very definite estimate as to the limits or area of this concealed part. There was a gradual development of collieries sunk through the western part of the Permian rocks, especially in the adjacent county of Nottingham, which added considerably to our knowledge. Another Royal Commission on Coal Supplies reported in 1905, that part of the Report relating to Yorkshire, Derbyshire and Nottinghamshire being written by Professor P. F. Kendall, another past-president of this Union who, by means of data shown by collieries and borings, with special consideration of the folding and faulting of the area, was able to show that the Coal Measures between the visible coal-field and the east coast had a much wider extension than the most sanguine estimates of the earlier Commission. He estimated, with becoming reserve, the total area of unproved coalfield to be 3885 square miles.*

* Final Report of Royal Commission on Coal Supplies, Pt. 9, 1905.

Since this Report, much additional information has been gained. The Geological Survey has been active in re-surveying the Coalfield. Dr. Walcot Gibson wrote the Geological Survey Memoir on the Concealed Coalfield of Yorkshire and Nottinghamshire, published in 1913, and a second edition of this, written by Mr. G. V. Wilson, has been published quite recently. This informs us that the area has been *proved*, by borings and shafts, to cover about 1200 square miles. Since the publication of the first edition about forty borings and sinkings have been made, a significant fact emphasising the great developments which are taking place. As an instance nearest home, one has only to compare the Doncaster district now with what it was a quarter of a century ago. Then, besides a railway centre, the chief town of a large and fertile agricultural area, it is now the hub of a great population, employed in winning coal from the largest and best equipped collieries in the country. One colliery alone has turned out 30,000 tons in a week.

These borings and sinkings have furnished considerable knowledge of the underground geology of the area. The main objective is the Barnsley Bed of Coal, upon which the prosperity of the collieries mainly depends, because of its thickness, and its marketable qualities. In the Doncaster district the seam averages about 9 feet in thickness, though only 6 to 7 feet is saleable coal, but a few miles away it is split up by dirt partings. Other seams of commercial importance are the Shafton above and the Dunsil below the Barnsley Bed.

The complete sequence of the Permian rocks has been proved at several Yorkshire localities : Haxey, 557 ft. ; Selby, 624 ft. ; and at Market Weighton more than 971 ft. The greatest thickness of Triassic rocks proved is 2127 ft. at Market Weighton, there the Bunter alone being 1425 ft. thick. Except in a very small area near Doncaster, the Upper Coal Measures are absent, and the Lower Coal Measures have not been definitely identified in any of these sections, the productive Coal Measures belonging solely to the Middle division.

One cannot pass from this part of the subject without mentioning Marine Bands in the Coal Measures, especially as a late member of this Union, and my predecessor as its Hon. Treasurer, did so much towards their elucidation. During the sinking of the great collieries at Bentley and Brodsworth, he spent the greater number of his week-ends in the most careful examination of the materials brought up. In the former he found two bands containing marine fossils, and in the latter four, and contributed valuable papers upon his discoveries in our own journal, and in *The Proceedings of the Yorkshire Geological Society*. Whilst most of these bands are of local occurrence, and do not yield a fauna either large in number or variety, evidently being the result of partial and temporary

incursions of sea water into the swamps in which the Coal Measures were deposited, there is one, the Mansfield Marine Bed, which has been found in practically 'every boring and sinking in Yorkshire and Nottinghamshire, and its importance as a definite horizon in the Coal Measure sequence is now generally recognised.* Its thickness, and the large area over which it is found, with its prolific and varied fauna, indicate an extensive and possibly prolonged occupation by the Carboniferous sea, and the close resemblance of the fauna to that found above the Gin Mine of North Staffordshire suggest it was continuous in that direction. It is noteworthy that *Lingula*, one of the very few animals that have survived from the earliest geological periods to the present, is the most persistent fossil in this bed, and is found in all the other marine bands.

Another point established by these borings and sinkings is the impossibility of drawing a definite dividing line between the beds of the Triassic and Permian formations. Whilst the Upper Magnesian Limestone gives a definite horizon in the Permian, when present, it is difficult to place the beds between that and the Bunter Pebble Beds, where they exist.

The detached small Coalfield at Ingleton has been more extensively worked, of late years, but there is not yet evidence sufficiently clear to establish its proper position in the Coal Measures or its connection with other coalfields.

New railways made in the southern part of the county have thrown considerable light on the geology of the Permian rocks.

The working of the seams of ironstone in the Liassic rocks of Cleveland, especially the Main Seam, was only beginning to assume importance in the decade previous to the period under review, and owing to the proximity of this great supply of good and easily worked ore, the iron and steel trade of north-east Yorkshire has become a vast industry, great towns have grown up, and Middlesbrough, the chief one, has increased its population from 7631 in 1851, to 131,103 in 1926.

The manufacture of alum from the shales of the Upper Lias, once an important trade in Cleveland, declined about the same time as the working of the ironstone began. From the large excavations made, when extracting the shale, most of the Yorkshire specimens of Liassic reptiles now in our museums were obtained. By 1871 the industry was dead, its product having been superseded by alum made by treating Coal Measure shales with sulphuric acid.

Very little jet is now mined in north-east Yorkshire. Its getting, and working, used to find employment for a large

* Geol. Survey Mem., Concealed Coalfield of Yorks. and Notts., second ed., p. 31.

number of people, but there is now little demand for it, owing mainly to changes of fashion.

The carrying out of large schemes of waterworks extensions has afforded special opportunities of studying the geology of some of our valleys, and the making of a great sewer right across the city of Leeds has provided details of a long, if not deep, section of the rocks passed through, to be made, and it is noted with satisfaction that a large-scale copy of this has been secured by the Leeds Geological Association.

The quarrying of huge quantities of various kinds of stone, for many purposes, has added much to our knowledge of the rocks of the county.

The salt industry of Tees-side should also be mentioned. As a result of borings, rock-salt was discovered at a depth of 1200 to 1500 feet. Water is passed down to this, by means of tubes, it dissolves the salt, and is pumped up, and the salt is obtained by evaporation.

(*To be continued).*

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COMMITTEE OF SUGGESTIONS: RIVERS INVESTIGATION.

A MEETING was held in the Botanical Department of the Leeds University on December 2nd, Prof. Priestley taking the chair. Reports on the work done during the year were given by Messrs. Percival, Brown, Johnson and Garner.

Since June, 1926, visits have been made monthly to the three stations adopted, *i.e.*, Grassington, Pool and Ulleskelf, samples of water being taken and collections made. It is hoped that it will be possible to continue these regular visits for a further twelve months, giving eighteen in all, six of which overlap and will check the first six months. Messrs. Johnson and Garner handed in the results of the examination of the water samples by the Rivers Board Chemists, these included chemical, physical and bacteriological tests. Mr. Brown stated that the molluscan fauna had been worked out in these preliminary visits. Mr. Percival pointed out that the adult mayflies and Trichoptera will require careful collection throughout a whole year before a statement can be made. The latter gentlemen hope to work up the zoo-plankton during this winter, and the Rev. W. L. Schroeder undertook to help with the examination of the Phyto-plankton, this being held up owing to Dr. Pearsall's absence in America.

Mr. Johnson pointed out an anomaly which had been noted in the abnormally high oxygen saturation of the water at Pool, and he suggested this required a more detailed examination than the three stations gave, this saturation may be due to the effect of sewage pollution increasing the plant life, and he suggested the ponding of the water above the weir at Otley may be helping in this matter. He also wished to obtain some figures showing the time a body of water took to move down the river, and an estimate of the quantity of water at the various stations. Daily readings of the guages placed on the bridges are most desirable.

It is evident that the scheme adopted is all the committee can undertake at present, but if more helpers were available it might be possible to increase the range of the work. We are indebted to the Royal Society for a grant of £50 towards the expenses, and the Rivers Board have kindly defrayed the cost of alternate visits.—CHRIS. A. CHEETHAM.

NOTES ON YORKSHIRE AMMONITES.*

THE Ammonites, the discussion of which forms the basis of this publication, are derived Jurassic species obtained from the Holderness Drift, and are now preserved in the Hull Museum. They were collected and described, in 1913, by Mr. C. Thompson, some being provisionally named by Mr. S. S. Buckman. They were further discussed in a series of papers by Dr. L. F. Spath in *The Naturalist* during the last two years. These articles are now reprinted in pamphlet form, and issued at the modest price of one shilling.

Eight of the papers are concerned with ammonites that originally came from the Lower Lias. The description of the Yorkshire forms seems rather overshadowed by a mass of detail concerning the evolution of certain ammonite groups which provides material chiefly for the ammonite specialist. But several distinct general impressions emerge from these heavily italicised pages. There is, for instance, Dr. Spath's theory that the larger ammonite families are derived as successive offshoots from the persistent root-stocks *Phylloceras* and *Lytoceras* of the Mediterranean area. This attractive conception seems to explain more of the known facts than do former theories and, if only for this reason, merits serious consideration.

One is glad to note, too, that Dr. Spath emphasises the necessity of careful field-work in dealing with palaeontological material, and it is to be hoped that Yorkshire geologists will heartily respond to his appeal. Dr. W. D. Lang has shown what can be done in this way by his detailed maps of the Dorset coast; similar maps of the Yorkshire coast would be a valuable addition to geological literature. Moreover, any attempt to describe the evolution of ammonites seems futile until their exact succession is recorded and interpreted. Many museum specimens are notoriously lacking in this respect, and the only way out of the difficulty lies in careful collecting and mapping. The speculations of some writers on so-called biological principles are worse than useless, since they make confusion worse confounded.

It is comforting to read (in Section IX.) that 'nomenclature will right itself in time,' though 'a simplification of nomenclature is not possible in the present state of our knowledge.' But the general geologist will hardly agree that 'diagnoses of new genera are undesirable; they may mislead the beginner,' but it must be remembered that much of the present confusion in palaeontological nomenclature is due to loose and insufficient definition of types.

* By Dr. L. F. Spath, *Hull Museum Publication No. 143.* 72 pp.,
price 1/-.

Upper Liassic Ammonites are briefly mentioned in Chapter X. Referring to the diversity of Dactyliocerates, the author makes the unexpected (though welcome) statements, 'there are already too many of these ammonite species,' and 'when the necessary zonal collecting in the Upper Lias has been done, it will be found that these numerous names are a hindrance rather than a help.' Moreover, in a revision of the Middle Jurassic, some of the hypothetical hemeræ of Mr. Buckman are grouped together in zones shown in a compact table. After admitting that 'sub-divisions of these zones into local smaller horizons is possible where they are exceptionally developed,' Dr. Spath advocates a 'return to a more reasonable (*i.e.* wider) interpretation of species' as being 'desirable from the palæontological as much as from the stratigraphical point of view.'

This handy reprint thus furnishes much food for thought, and should be read by all workers in Jurassic geology.

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Bittern near Huddersfield.—A bittern was shot by one Wright Hirst (now dead) 'about seventeen years ago' in a field at the bottom of Harden Clough, Meltham, quite near to the Convalescent Home. This is substantiated by his daughter, in whose possession the bird now is. It is a good specimen, and was mounted by Gough, of Almondbury Bank.—CHARLES MOSLEY, The Museum, Huddersfield.

Abnormal Fungoid Growth.—On October 30th, I found, in the Mollicar Wood, near Huddersfield, two curious fungi. I submitted them to the Director of the Royal Botanic Gardens at Kew, who states they were 'a species of *Cortinarius*. The growth, however, is abnormal, owing to the formation of a hymenium on the upper surface of the pileus, giving the whole a morel-like appearance. Similar abnormalities are known in other genera of the Ochrosporæ.'—CHARLES MOSLEY, The Museum, Huddersfield.

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In Savage Australia, by Knut Dahl. London : Philip Allan and Co., xi. + 326 pp., 21/- net. Australia has always a fascination for the naturalist, the peculiarity of its fauna and the interest attached to the aboriginal tribes giving much food for thought. The fact that large areas in the Continent are still in their original state adds to its charm. The author's training in the Zoological Museum of the Norwegian University probably has had much to do with the scientific value of his narrative. Not only does he deal with prehistoric remains and ably compares them with modern conditions, but he describes the topographical and zoological features, makes excellent sketches of many, and reproduces photographs of others. His style is by no means technical, and there is no doubt his book will appeal to a much larger circle of readers than does the average book on similar subjects.

**THE YORKSHIRE NATURALISTS' UNION'S
SIXTY-FIFTH ANNUAL REPORT
FOR 1926.**

(Continued from page 22).

Scarborough and District (W. J. Clarke) :—During 1926 the recorder has received welcome assistance from two keen young observers, Messrs. J. A. and D. G. Stevenson, who have made some good records.

On November 2nd, 1925, a Sea Lamprey just over 2 ft. in length was captured at Scarborough. A Sturgeon 4 feet long was landed on January 5th, 1926.

Several Spotted Rays were observed on the Scarborough fish market, and the species appeared to be more abundant than usual. The Starry Ray also appeared on several occasions, and does not seem to be very uncommon. In the 'Vertebrate Fauna of Yorks.' it is mentioned as one of the rarest species. Picked Dogfish have been very abundant during the warm months. On April 30th Mr. J. A. Stevenson brought me the head and tail of a Large Spotted Dogfish measuring 4 feet in length, a very rare Yorkshire species. Only one Porbeagle Shark has been seen on the fish market this year; they are often caught, but are not brought ashore. A Three-bearded Rockling, captured on rod and line on July 28th, had attained a length of 14 inches without developing the spotted skin of the adult form.

A single Red Gurnard was landed on February 4th. This is the first Yorkshire specimen I have seen, the red variety of the Grey Gurnard being commonly mistaken for it. A long Rough Dab was also landed on February 4th, and others have been seen.

Montagu's Sucker has been abundant in the rock-pools near low water mark, and several examples of the Pogge and the Four-horned Cottus have been dredged close inshore. A Worm Pipefish taken by Messrs. Stevenson at low-water mark at Scarborough on July 30th is the first Yorkshire specimen I have seen. Two were recorded from Robin Hood's Bay on August 29th, 1913, but upon doubtful evidence which could not be substantiated. The species is not included in the 'Vertebrate Fauna of Yorkshire.'

**WILD BIRDS AND EGGS PROTECTION
COMMITTEE.**

Birds and Eggs Protection Committee (F. H. Edmondson) :—The Breeding Season for 1926, although somewhat patchy, has been a good one. Migrants arrived about the usual time and generally increased in numbers, the one bird which shows a serious decrease is the Corn Crake, and I do not think that above half the normal number have been with us.

The brood of one pair of Peregrine Falcon has been destroyed by someone, probably a game-keeper; one pair in N.W. Yorkshire reared its young, and another pair on the borders of Yorkshire and Lancashire was also successful.

Five or six pairs of Stone Curlew arrived at their breeding station in the North Riding, three sets of eggs were seen and the young are known to have flown.

We secured the services of the same watcher as last year for evenings, Saturdays, and Sundays at Hornsea Mere, and this seems to have worked very well. Y.N.U. members who visited Hornsea Mere at Whitsuntide reported all in order, and good numbers of birds were seen.

The Fulmar Petrel has again bred this year along the Cliffs. Early in the season good numbers of birds visited the Cliffs, but they dwindled away as time advanced. On August 1st we visited Bempton and found

two young birds in the down, also we saw two young birds flying. On August 15th the two young ones were still on the ledge. A few young birds and several old ones were flying over the cliffs.

The Lesser Terns arrived at Spurn about April 29th. On May 8th, twenty-one sets of eggs of Ring Plover were marked. On May 17th the first Tern's eggs were marked. May 31st several nests were destroyed by high water. The last eggs were marked on July 4th. On the whole I think we have had a medium season at Spurn, although we have again been troubled by Crows and Magpies. A gale of wind drifted some of the nests over, a few were washed away. A torrential thunderstorm on June 14th did part damage. A few pairs of Common Terns were seen, but I do not know that they bred; also one or two pairs of Oyster Catchers were seen.

The Green Plover has increased all through the county, certainly we have more this year than we had a few years ago; their biggest enemy has been the Rook.

A few pairs of Merlin in the West Riding have been successful in rearing their young, many nests have been destroyed by game-keepers.

I am sorry to report that the Little Owl has increased as a breeding species in the county, and I am afraid that we shall have trouble with this alien in the near future. If any reader has any definite information to give, either for or against it, I shall be pleased to receive their reports.

BALANCE SHEET.

RECEIPTS.	£	s.	d.	£	s.	d.
Mr. A. Hirst ...	5	0	0	Mr. E. W. Wade	...	0 10 6
Mr. W. H. St. Quintin	5	0	0	Mrs. J. S. Binns	...	0 10 0
Major Dent ...	2	2	0	Mr. E. Cockshaw	...	0 10 0
Mr. J. Atkinson ...	1	1	0	Mr. R. Chislett	...	0 10 0
Mrs. Bishop ...	1	1	0	Miss Edmondson	...	0 10 0
Mr. H. B. Booth ...	1	1	0	Mr. W. J. Forrest	...	0 10 0
Mr. Chas. O. Saner ...	1	1	0	Mr. J. Y. Granger	...	0 10 0
Miss Waterhouse ...	1	1	0	Mr. W. E. Mayers	...	0 10 0
Mr. J. Wilkinson ...	1	1	0	Mr. G. Porritt	...	0 10 0
Mr. F. H. Edmondson	1	0	0	Mrs. Yellowlees	...	0 10 0
Mr. R. H. Edmondson	1	0	0	Mr. E. W. Taylor	...	0 7 6
Mr. J. M. Mathers ...	1	0	0	Mr. Greevz Fysher	...	0 5 0
Capt. C. Scott-Hopkins	1	0	0	Mrs. E. Horton	...	0 3 0
Mr. S. H. Smith ...	1	0	0	Mrs. J. Wood ...	...	0 2 6
Mr. W. G. Bramley ...	0	15	0	Mr. W. Waterhouse	...	0 2 6
Mr. H. J. Behrens ...	0	10	6	Sale of Microcosm	...	1 0 0
Mrs. Dibb ...	0	10	6			
Mr. J. Dibb ...	0	10	6	Total Subscriptions	...	35 18 6
Mr. E. B. Gibson ...	0	10	6	Bank Interest to June	0	5 3
Mr. A. Haigh-Lumby	0	10	6	30th, 1926 ...	...
Mr. A. Jordan ...	0	10	6	Balance from Season		
Mr. J. F. Musham ...	0	10	6	1925 ...	...	13 5 8
Mr. W. H. Parkin ...	0	10	6			
Mr. C. H. Proctor ...	0	10	6			
						49 9 5

PAYMENTS.	£	s.	d.	£	s.	d.
Mr. J. W. Medcalf ...	15	15	0	Cheque Book ...	...	0 4 0
Mr. J. B. Clubley ...	6	0	0	Commission ...	...	0 0 3
Mr. M. Hodgson ...	4	0	0			
Mr. J. Green ...	3	0	0	Total Cost ...	...	30 9 3
Mrs. Capstick ...	1	0	0	Balance in Hand	...	19 0 2
Mr. N. Pateman ...	0	10	0			

Audited and found correct,

W. E. L. WATTAM,
8th October, 1926.

FREDA EDMONDSON,
Hon. Treas.

I should like to thank all who have helped us with funds; but I still think it is worth while to point out to the Entomologists and Botanists, that while we are protecting our birds, in many instances we are also protecting both flowers and insects in the localities where our watchers are stationed.—F.H.E.

BOTANICAL SECTION.

Botanical Section (J. F. Robinson):—In all the cold spells which lasted till nearly the end of May, the amount of sunshine was unusually large. As a consequence flowering began early—Yellow Jessamine on south-facing walls, as well as White Butterbur in one or two of its East Riding stations showed their first flowers early in February. By the middle of the month the expanded flower 'heads' of Coltsfoot, the staminate catkins of Hazel in great abundance, and the flowers of Wych and common Elm were all much in evidence. By the 6th March, Sweet Violet, Wood Anemone, and Lesser Celandine were all in flower near Ripon, and on the 13th *Saxifraga oppositifolia* had opened its purple flowers on Moughton Scar. About the same time, in North and West Ridings, bloomed spring Whitlow Grass, Primrose and Gagea. In the case of the second such a Primrose profusion was rarely if ever known before. Those who saw the woods, lanes, and grassy banks of North-east Yorks. last spring will be able to confirm this estimate. Of Gagea, in March last, in an eastern district of North Riding Yorks., a new station was found for this uncommon species. The latter end of March was cold, but remarkably sunny on the whole, and the beautiful weather at Easter, the first week of April, will long be remembered with pleasure. Then Blackthorn, Plum, and other members of genus *Prunus*, notably Gean, flowered most profusely. The show of Bilberry blooms was most extraordinary, often giving a rosy-pink tint amongst the Goathland Moors, N. Yorks. That Blackthorn and Plum, as well as Bilberry, have not fulfilled their promise of abundance of fruit is accounted for by the long cold spell which commenced late in April and continued till the last week of May. Still, with the prevalent sunshine, plants flowered remarkably well, and Hawthorn this year was easily a May blossom in Yorkshire. Indeed, on 1st of the month (an exceptionally early date for it in our latitude), at Askern 'May' was fully out. In the North and East Ridings in mid-May the Hawthorn blossom, but apparently with only average regularity.

Lilac, particularly the white variety, and Laburnum had in mid-April abundance of flower buds showing, but these were nipped and blackened before the flowers opened. The frosts of May would also account for rendering useless the blossoms of Cherry, Apple, and more especially the 'Crab' and Pear; but in many orchards of the East Riding the crop of Pears is good, and in some instances remarkably heavy.

From the last week in May onwards fine normal summer weather prevailed. Oak and Beech everywhere flowered abundantly, but Ash not at all or only sparingly, according to widely separated reporters.

New stations have been noted in the case of several species, e.g., at the Hornsea meeting some of the party who got to Spurn brought back specimens of *Ornithogalum umbellatum*, which was the first record from this Ultima Thule of Yorks. Later, on 4th July, one of the East Riding societies again visited Spurn, and noted such species as Sea Holly, *Chloro perfoliata*, the Bee Orchis and much very fine *Orchis pyramidalis*. Further, this report vouches for the fact that never more abundant or finer than during the present season were the flowers of Dwarf Cornel, Chickweed Wintergreen and May Lily in their old stations among the North York Hills. The same may be said of the blooms of Heather and Cross-leaved Heath, and of the beautiful Marsh Gentian on the sandy tract of Allerthorpe Common early in September. Visitors

to Austwick Moss during the summer speak of the wonderful display in finest bloom of the three orchids, the Spotted, Marsh and Butterfly, especially the last, which persisted in quantity for some weeks.

Roses, both wild and cultivated, have blossomed exceedingly well, and while writing this report on the 12th day of October, a bunch of very fine standard blooms from Swanland, on the Yorkshire Wolds, gave a fragrant atmosphere to the room.

An exhaustive account from Cowling does not fail again to mention the long continuance of Primrose flowering on a north-facing hillside at an elevation of 900 feet. The first flower had opened on 31st October, 1925, and the last one 'withered away' on July 28th, 1926, a period of just nine months (in 1924-25 the time was six months).

From the same report it transpires that the Bristly Oxtongue, a common East Riding species, is growing as a casual in Lothersdale, West Riding Yorks.

Mention must be made to the marked tendency this season for the biennials like Turnip, Beet, Mangold-wurzel, etc., to become annuals, at least, so far as flowering goes. We have no evidence they have actually 'run to seed,' and they will scarcely do so after this late date.

(*To be continued.*)

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The Ascent of Man, by Means of Natural Selection, by Alfred Machin. London : Longmans, Green & Co., xx.+325 pp., 7/6 net. This essay is based, in the main, on the works of the two giants of evolution theory—Darwin and Spencer. To the writer it seemed that Spencer had seized the vital facts and appreciated their true significance, while Darwin had grasped the fundamental cause, operative on those facts. Unfortunately, neither of these great thinkers seems to have had any proper understanding of the work of the other, and so the two great inspirations, which mutually explained and interpreted one another, were never brought into close connection.' The author then expands this proposition under the heads of The Case for Enquiry ; Natural Selection ; The Ascent of Man by means of Natural Selection ; Part I., The Facts ; Part II., The Instrument of Interpretation ; Part III., Examination of the Facts in the Light of Natural Selection.

Forest, Steppe and Tundra : Studies in Animal Environment, by Maud D. Haviland. London : Cambridge University Press, 218 pp., 12/6 net. Mrs. H. H. Brindley, better known to the ornithological world as Maud Haviland, is one of the scientific workers upon whose writings can be placed every possible reliance. English scientific publications have long benefited from the results of her observations, in connection with which she had the rare distinction of being elected an honorary member of the British Ornithologists' Union. The present work is based on a series of essays given at Cambridge a little while ago, and refers to the associated fauna and flora of a typical rain-forest of Guiana, the steppe of Southern Russia and Western Siberia, the Arctic tundra, and the taiga or coniferous forest which covers sub-arctic Eurasia and America. She describes the animals of each region and the moulding of them to their environment either by modification of form and function or by modification of behaviour and life history. There are several interesting plates showing topographical features of the areas visited ; those which will appeal to our readers the most illustrating protective coloration in insects.

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The local papers for December 12th recorded that a perfectly white Water-hen had been shot by Mr. H. Lawson on his farm in Little Hale Fen, Lincolnshire.

DIPTERA COLLECTING IN EAST YORKSHIRE.

CHRIS. A. CHEETHAM.

THE following notes were made on a long week-end spent with Mr. F. W. Edwards. We met at Selby on July 2nd, and spent an hour or two at the crossroads on the Wistow, Bishopwood Road. We particularly wished to collect *Nephrotoma dorsalis* F., which I had previously found here in plenty; we finally got three or four specimens after a lot of sweeping and beating. We were pleased to get *Pachyrrhina analis* Schum., and somewhat surprised to find *Mochlonyx velutinus* Ruthé in quantity, the date being late for this species. Other interesting insects from here were:—

<i>Ochlerotatus (Aedes) annulipes</i> , Mg.	<i>Chilosia pulchripes</i> Lw.
<i>Culicella fumipennis</i> Stph.	<i>Mycophaga fungorum</i> Dsv.
<i>Callimyia speciosa</i> Mg.	<i>Fannia fuscula</i> Fln.
<i>Thereva nobilitata</i> F.	<i>Cænosia rufipalpis</i> Mg.
<i>Gymnopternus metallicus</i> Stan.	<i>Aphiochæta longicostalis</i> Wood.
<i>Xanthochlorus ornatus</i> Hal.	

Next day, on Skipwith Common, we found *Ochlerotatus nemorosus* Mg., very vicious and persistent, and saw *Verrallia aucta* Fln. hovering in small swarms. Others identified by Mr. Edwards are:—

<i>Ezechia contaminata</i> Winn.	<i>Isohelia sociabilis</i> Goet.
<i>Tanypus nemorum</i> Goet.	<i>Culicoides ?albicans</i> Win.
<i>T.</i> species inconc. New to B. M.	<i>Camptocladius</i> sp.
<i>Bezzia bicolor</i> Mg.	<i>Cricotopus ?amasia</i> Mg.
<i>B. gracilis</i> Winn. New British record.	<i>Tachydromia ciliaris</i> Fln.

From here we went to Castle Howard, and had an hour or so by the lake. Mr. Edwards was very impressed with the results; the possibilities for Chironomids seem very great here. His list included additions to the Museum collection:—

<i>Palpomyia lineata</i> Mg.	<i>Chironomus rufipes</i> L.
<i>P. erythrocephala</i> Staeg.	<i>C. cinatellus</i> Goet.
<i>P. ferruginea</i> Mg.	<i>C.</i> Several others undetermined.
<i>Clinohelea unimaculata</i> Mcq. New to B. M.	<i>Gnophomyia tripudians</i> Bergr.
<i>Johannsenomyia nitida</i> Mcq.	<i>Helius longirostris</i> Mg.
<i>Probezzia rubiginosa</i> Winn. New to B. M.	<i>Microchrysa cyaneiventris</i> Zett.
<i>Bezzia nobilis</i> Winn. ♂ new to B. M.	<i>Chloromyia formosa</i> Scop.
<i>Dicrobezzia venusta</i> Mg.	<i>Beris clavipes</i> L.
<i>Bezzia solstitialis</i> Winn. ♂ new to B. M.	<i>Psilopus platypterus</i> F.
<i>Culicoides pictipennis</i> Winn.	<i>Dolichopus pennatus</i> Mg.
<i>Tanypus</i> (sens. lat.) <i>nervosus</i> Mg.	<i>Hercostomus metallicus</i> Stan.
<i>T. vilipennis</i> Keiff.	<i>Chilosia sparsa</i> Lw.
<i>T. longipalpis</i> Goet.	<i>Liogaster splendida</i> Mg.
<i>T. (sp. incl.).</i> Same as Skipwith.	<i>Helophilus lineatus</i> F.
	<i>Pyrophæna granditarsa</i> Forst.
	<i>Ascia geniculata</i> Mg.
	<i>A. dispar</i> Mg.
	<i>Pipunculus fuscipes</i> Ztt.

Ceromasia auripila B.B.
Paralleloma albipes Fln.
Ditænia cinerella Fln.
Hedroneura cucularia L.

Sepsis punctum F.
Agromyza capitata Ztt.
Notiphila riparia Mg.

Our next stopping place was Gormire. Here we found very good localities for the small Chironomids, and many other genera. I purposely omit species which I have previously recorded from this district or vice-county 61 :—

Trichosia hirtipennis Ztt.
Mycetophila vittipes Ztt.
Platyura fasciata Ltr.
Macrocerca phalerata Mg.
M. angulata Mg.
M. centralis Mg.
Diadocidia ferruginosa Mg.
Dixa aestivalis Mg.
D. amphibia.
Corethra plumicornis F.
Hybos femoratus Müll.
Ardoptera irrorata Fln.
Empis aestiva Lw.
E. grisea Fln.
Hilara thoracica Mcq.
H. interstincta Fln.
Hemerodromia praecatoria Fln.
Chelipoda melanocephala F.
Argyra leucocephala Mg.
Dolichopus atratus Mg.
Xanthochlorus ornatus Hal.
Sympycnus aenicoxa Mg.
Chalarus spurius Fln.
Verrallia pilosa Ztt.
Callimyia amena Mg.
C. speciosa Mg.
Agathomyia antennata Ztt.
Hæmatopota crassicornis Whlbg.
Chilosia illustrata Harr.
Sericomyia borealis Fln.
Eristalis sepulchralis L.
Ascia floralis Mg.
Hylemyia lasciva Ztt.
Pseudocenosia longicauda Ztt.
Helomyza lœvifrons Lw.
H. similis Mg.
H. notata Mg.
Heteroneura albimana Mg.

H. ruficollis Mg.
Clusia flava Mg.
Agromyza capitata Ztt.
Gymnophora quartomollis Schmitz.
Clinohelea unimaculata Mg.
Palpomyia distincta Hal. Var.
 new to B. M.
P. semifumosa Goet.
P. brachialis Hal.
P. nigripes Mg.
P. flavipes Mg.
P. serripes Mg.
P. ferruginea Mg.
P. lineata Mg.
Bezzia solstitialis Winn.
Forcipomyia ?pallida Winn.
Atrichopogon rostratus Winn.
Tanypus monilis L.
T. nugax Wlk.
T. melanurus Mg.
T. falciger Keiff.
Chironomus gripekoveni K.
C. pedellus Deg.
C. tendens F.
C. dispar Mg. (verr. coll.)
C. latidens Goet.
C. sp. New to B. M.
Tanytarsus punctipes Wied.
T. signatus v.d. W.
T. sordens v.d. W.
Corynoneura innupta Edw.
Orthocladius vernalis.
Psectrocladius sordidellus Ztt.
Cricotopus sylvestris Mg.
C. tibialis Mg.
C. sp. inc. New to B. M.
Metriocnemus adjunctus.
Camptocladius leucopogon Mg.

We made a trip over the hill to Hawnby, but collected the following in a bit of woodland by the streamside below Boltby :—

Tanypus trifascipennis Ztt.
T. triannulatus Goet.
T. carneus F. (var.).
Palpomyia brachialis Hal.
Empeda nubila Schum.
E. flava Schum.
Ormosia albitibia Edw.
Oreogeton flavipes Mg.

Tachista arrogans L.
Chrysotus neglectus W.
Beris geniculata Curt.
Hebecnema nigricolor Fln.
Cænosia lineatipes Ztt.
Paranthomyza nitida Mg.
Themira pusilla Ztt.

At Hawnby, we collected in a more open type of country, rough pasture by the streamside, which gave us :—

<i>Tanypus dubius</i> Staeg.	<i>Hilara litorea</i> Fln.
<i>Palpomyia semifumosa</i> Goet.	<i>Symphoromyia crassicornis</i> Pz.
<i>P. brachialis</i> Hal.	<i>Tachydromia flavipes</i> F.
<i>P. praestuta</i> Lw.	<i>Sargus flavipes</i> Mg.
<i>P. flavipes</i> Mg.	<i>Chilosia antiqua</i> Mg.
<i>P. distincta</i> Hal.	<i>Chrysogaster hirtella</i> Lw.
<i>Chironomus</i> sp. near <i>pictulus</i> . New to B. M.	<i>Loxocera aristata</i> Pz.
<i>Ptychoptera lacustris</i> Mg.	<i>Elgiva dorsalis</i> F.
<i>Pachyrrhina analis</i> Schum.	<i>Phaonia basalis</i> Ztt.
<i>Idioptera mundata</i> Lw.	<i>Trichopticus nigritellus</i> Ztt.
<i>Ephelia marmorata</i> Mg.	<i>Cænosia rufipalpis</i> Mg.
<i>Achalcus flavicollis</i> Mg.	<i>Psila nigromaculata</i> Stbl.
<i>Pipunculus campestris</i> Ltr.	<i>Sepsis nigripes</i> Mg.
<i>Platycnema pulicaria</i> Fln.	<i>Centor elongata</i> Mg.
	<i>Pteropæctria frondiscentiae</i> L.

This concluded our trip ; but Mr. Edwards was anxious to see *Thaumastoptera calceata* Mg., which I had found in plenty in one spot in Crag Wood, Rawdon, a damp spot under a thick tangle of brambles and other bushes. We were fortunate to get a few specimens, as it was some three weeks earlier when I saw it abundant there. Mr. Edwards collected the following in these woods :—

<i>Dicranomyia pilipennis</i> Egg.	<i>Tanypus monilis</i> L.
<i>Empeda flava</i> Schum.	<i>T. nugax</i> Wlk.
<i>Dicranota bimaculata</i> Schum.	<i>Orthocladius vernalis</i> Goet.
<i>Boletophila tenella</i> Winn.	<i>Cricotopus bicinctus</i> Mg.

Mr. Edwards identified all the Chironomids and Limnobiids and I am much indebted to him for lists from which the above is compiled.

—: o :—

CORRESPONDENCE.

NAME OF EAST YORKSHIRE BOTANIST.

In a collection of dried plants in the possession of Mr. W. Arthur Sledge, B.Sc., Leeds, which I have been privileged to inspect, there are several specimens of East Riding plants labelled with stations near Beverley, dated in the 'forties of last century, and with the collector's initials, 'H.H.' and occasionally 'Beverley.' One plant, *Goodyera repens* (Orchidaceæ), said to have been found at 'Houghton Wood' in 1841, has also the 'H.H.' ; and it is with reference to the identity of 'H.H.' that Yorkshire botanists of the present day would be glad of information. No name in Britten's 'Alphabetical List of Deceased British Botanists' or other historical work answers to the said initials. Can any reader of *The Naturalist* kindly give us any information that might lead us to the required identity?—J. FRASER ROBINSON, 22 Harley Street, Hull.

—: o :—

In an article on Irish Green in *The Quarry* for last December, the writer says : 'It is not a serpentine rock in the modern sense, and the brilliant green bands which it displays are not fossil snake skins, as a correspondent seems to suggest.'

SOUTH-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.

At the invitation of Mr. G. T. Porritt, the members of the above society met at his residence on November 27th, 1926. At the afternoon meeting Mr. J. Hooper showed a series of a reddish form of *Noctua xanthographa* from Barmouth, and the dark West Riding form for comparison; and a specimen of *Plusia moneta* taken at Overton, Wakefield, in July last. Mr. E. Cocker showed a series of *Arctia caja*, bred from local larvæ, which included a few good light and dark varieties.

The President, Mr. B. Morley, to introduce a discussion on the colours of lepidoptera, showed examples of *Heliconius telesiphe* as a model with *Colænis telesiphe* as mimic from Brazil; the combination of *Metaporia agathon*, *Papilio apycides* and *P. macarius* as mimics to *Danaida melanoides* from North India; *Danaida tytia* and its mimic *Papilio agestor*, also from North India; and *Euplea linnei* with its mimic *Elymnias leucocyma* from Assam.

Mr. Morley suggested that the colours displayed by lepidoptera seem to have been considered mostly from the narrow utility basis that they must be of special benefit. Every colour and shade imaginable are found in the group, yet the possibility that colour may have an aesthetic aspect is seldom advanced.

The inedible *Danaidæ* are rarely brilliant, and while it is conceivable that similarly coloured species occurring with them may be benefited thereby, why should other brilliant forms be said to possess warning colours? Perhaps it would be as reasonable to say of them that their colours were mere caprice.

He also raised the question as to whether birds actually specialize on butterflies for food, as they do on some moths; and also whether any species of lepidoptera, while in the larva stage, had developed immunity from parasitic attacks, the source of their greatest danger.

On the question of variability in the colours of larvæ, he said that the larvæ of *Amphidasys betularia* fed upon hawthorn would be brown, while those fed upon sallow would be green, suggesting protective colouring on account of both colours of larvæ being similar to the twigs of the respective food plants.

But if the larvæ of *Numeria pulveraria* were similarly fed, they would be alike in colour on both food-plants; but in the perfect stage those fed upon hawthorn would be a rich reddish-brown, and the sallow fed ones would be greenish grey. Other similar instances were mentioned, and the subject provoked an animated discussion.

The evening was spent in looking over the Mr. Porritt's insect collections, that of the Macro-lepidoptera containing nearly all the British species, including numerous historical specimens. Of these may be mentioned the only two *Notodonta bicolor*, taken by J. Ray Hardy at Killarney, in 1867 and 1868 (see *E.M.M.*, Vol. X., 1874, p. 212), from the Alfred Beaumont collection; the only three *Aplasta ononaria*, taken by F. O. Standish in Folkstone Warren (see *Ent. Record*, Vol. VIII., p. 13), from the Sydney Webb collection; Haworth's labelled type of the form of *Hadena suasa* he named *dens-canis*, etc. Also melanic specimens of most of the species in which melanism is known to occur; and the type specimens of a dozen or more of the varieties of *Abraxas grossulariata*.—B.M.

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The Editor of *British Birds* draws attention to the fact that a Kittiwake, ringed at the Farnes, in June, 1924, was caught in Labrador on October 28th, 1925. That journal's Bird-marking Scheme during the past seventeen years has resulted in no fewer than 170,000 wild birds having been ringed.

YORKSHIRE NATURALISTS IN LEEDS.

THE Sixty-fifth Annual Meeting of the Union was held on December 4th, in the Leeds City Museum. There was a well-attended meeting of the General Committee during the afternoon, over which the President, E. Hawkesworth, Esq., presided. At this meeting, the office of Honorary Treasurer, held by the President for the last fourteen years, passed into the hands of Mr. S. D. Persy Fisher. Mr. Wm. Horne, F.G.S., of Leyburn, was elected as an Honorary Member of the Union. Mr. Horne, the well known Wensleydale geologist and antiquarian, has attained his ninety-first year, and hearty congratulations were accorded him for his splendid work in the service of science in Yorkshire.

At the Annual Meeting, held in the evening, the Presidential Address was delivered from the Chair, in which the President was supported by the President-Elect (Mr. Wm. Falconer) and by Vice-Presidents Riley Fortune, H. B. Booth, Dr. T. W. Woodhead and Prof. J. H. Priestley. Under the title 'Sixty-five Years of Yorkshire Geology,' Mr. Hawkesworth reviewed the progress of geology through the period represented by the history of the Union, as will be seen in the pages of *The Naturalist*.

On the motion of Prof. A. Gilligan, seconded by Prof. J. H. Priestley, a hearty vote of thanks was accorded to the President for his address, and both speakers voiced the appreciation of the Union for the long and valuable services rendered by Mr. Hawkesworth as Honorary Treasurer. Thanks were also unanimously accorded to the Local Societies for their hospitality, the President of the Leeds Naturalists' Club (Mr. H. Whitehead, B.Sc.) responding; and to the Leeds Museum Committee, to which the Curator (Mr. H. Crowther) responded, after which the President referred to the work of the Honorary Secretaries in terms which drew the applause of the meeting. Thirty Affiliated Societies were represented at this meeting and five new members were elected.

The day's proceedings were terminated by a Conversazione, at the invitation of the Local Societies.—F.A.M.

— : o : —

The Natural History of Ants, by R. A. F. de Réaumur. New York : Alfred A. Knopf, xvii.+280 pp. Students of these fascinating animals will be grateful to Professor W. M. Wheeler, of Harvard, and to his publisher, for the charming volume which has been produced, and for the opportunity now given to English speaking naturalists easily to peruse the writings of René Antoine Ferchault de Réaumur. Huxley stated that he knew of no one who could be placed on the same rank as Darwin except Réaumur, and some of the work of this French naturalist is now available in a readily accessible form. After this introduction, Professor Wheeler gives an account of the life and work of Réaumur, which is followed by the original of his 'Histoire des Fourmis.' Then follows a translation of the same, with Annotations, and a List of Réaumur's Works between 1708-1763, which is surprising for its magnitude.

— : o : —

Dr. Dukinfield H. Scott gives an excellent account of 'New Discoveries in the Middle Devonian Flora of Germany' in *The New Phytologist* for December 24th. In the same journal Ethel M. Poulton gives 'Studies on the Heterokontæ,' and M. C. Rayner continues his work on Mycorrhiza.

On March 20th will be the two hundredth anniversary of the death of Sir Isaac Newton. We understand from *Nature* that 'A meeting to celebrate this bicentenary will be held under the auspices of the Yorkshire Branch of the Mathematical Association at Grantham, near which Newton was born, and in which he went to school.'

NORTHERN NEWS.

Dr. E. E. Lowe, of the Leicester Museum, is visiting America in connection with the Carnegie United Kingdom Trust and Museums.

An editorial in a contemporary says, 'We welcome this month some thousands of new readers.' The editor has evidently had a merry Christmas.

A large twinned cube of Fluor-spar from Weardale, measuring 11 inches along the edge, and weighing 93 lbs., has been presented to the British Museum.

A huge cuttle fish, five feet in length, dark grey in colour, and with a red fan-shaped tail, was recently washed up on the shore at Withernsea, and was cut up for bait.

The William Bolitho Gold Medal was awarded to Dr. R. H. Rastall for his researches on the Geology of Ore Deposits, at the recent Annual Meeting of the Royal Geological Society of Cornwall.

Mr. Ludwig Glauert, F.G.S., of the Western Australian Museum, contributes a 'List of Western Australian Fossils' to the *Bulletin*, No. 88, of the Geological Survey of Western Australia *Palaeontological Contributions*.

Under a protecting canopy supported on two posts is an enormous label, 'GRASS HAS A SKELETON OF SAND,' in front of the Cleveland Natural History Museum, Ohio. This is one of a number of items of information which the Museum authorities have prepared so that those who run may read.

The late Dr. A. W. Rowe's collection of Chalk fossils, consisting of 15,000 specimens, carefully labelled, has been purchased for the British Museum. Mr. G. W. Lamplugh's Collection of Lower Crustaceous fossils, including specimens from the Speeton clays, has also found a resting place in the same Institution.

Mr. H. J. Burkill, of 3 Newman's Court, Cornhill, E.C.3, sends a syllabus of the meetings of the London Natural History Society from January to June, and will be glad to see any readers of this journal, should they happen to be in London, at any of the meetings, which are held in Winchester House, E.C.2. Details of the meetings can be obtained from Mr. Burkill.

At the Leeds Meeting of the British Association on August 31st to September 7th next, under the Presidency of Sir Arthur Keith; Dr. H. H. Thomas will preside over Section C (Geology); Dr. G. P. Bidder over Section D (Zoology); Dr. R. N. Rudmose Brown, Section E (Geography); Professor F. G. Parsons, Section H (Anthropology); and Professor F. E. Fritsch, Section K (Botany).

As *Bulletin* No. 8, the Forestry Commission has issued an admirable and well-illustrated pamphlet on *British Bark-Beetles*, by J. W. Munro (H.M. Stationery Office, London, 77 pp., 2/6 net). The extraordinary activities of these boring coleoptera, and the very serious effect they have on Forestry, are well illustrated in this volume. The different species are enumerated, and illustrations of their critical anatomical characteristics appear, as well as enlarged drawings of the different forms.

The following description, which during the past few years has been given by most curators in this country when referring to other museums than their own, has now been used in connection with an excellent account of the Bowes Museum, which appears in *The Darlington and Stockton Times* for Christmas Day: 'The average museum, particularly in the smaller towns, is usually a dingy building housing a hotch-potch of curios from all over the world, collected in some sort of order, but practically valueless either to the student or the dilettante.'

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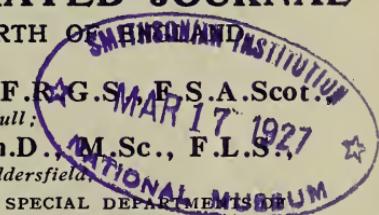
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NOTES AND COMMENTS.

PEAKLAND BADGER HUNT.

Mr. Henry B. Amos, of 101 Chandos House, Palmer Street, Westminster, London, sends No. 1 of a new journal entitled *Cruel Sports*. He also draws our attention to the following paragraph which appeared in *The Yorkshire Telegraph and Star* recently : ' Details of a remarkable badger hunt in the Darley Dale district have just come to light. A badger was traced into the Hall Dale woodlands, and first the haunt of the animal was fired with a view to suffocating it. The next day a dog was sent in, but came out bitten. Mr. Eric Smith then volunteered to explore, and excavations having been made, it was discovered that the haunt of the animal was in a large natural cave. Armed with a gun and carrying a flashlight, Mr. Smith entered the cave and found the badger resting on a ledge near the roof of the cave. He shot the animal, which proved to be a young one of 20 pounds.

CONCHOLOGICAL SOCIETY.

In the January issue of *The Journal of Conchology*, Mr. J. W. Jackson gives a history of the Conchological Society, in which he states : ' The society owes its origin to a band of four enthusiastic and able conchologists resident in Leeds, viz., Messrs. J. W. Taylor, W. Nelson, H. Crowther, and W. Denison Roebuck, who, at a meeting held on the 12th of October, 1876, at the residence of Mr. Nelson, founded "The Conchological Club, Leeds." The aims and objects of the club were the advancement of conchological science by the exhibition of specimens and the communication of information relating to every department of the science. Mr. Nelson was elected as the first President, and Mr. Roebuck acted in the capacity of Secretary. The formation of this club did not, however, come about in a spontaneous manner, but was the direct result of the publication of *The Quarterly Journal of Conchology*, which had been established by Mr. Taylor, with the assistance of Mr. Nelson, some two years previously, viz., February, 1874, for the purpose of popularising and extending the study of conchology, and to bring into closer relationship and friendship the few scattered conchologists of that period.'

OTHER PAPERS.

The same Journal gives a ' List of Molluscan Papers (chiefly on Cephalopoda) by the late Dr. W. E. Hoyle,' compiled by J. C. Melvill; ' *H. nemoralis* var. *rubella-fascialba* and var. *rubella-fascialba* oo300 in Staffordshire,' by J. W. Taylor; ' The Rate of Growth of *Planorbis*,' by J. E. Cooper; ' *H. arbustorum* var. *suprafasciata* and var. *trifasciata* in Staffordshire,' by J. W. Taylor; and ' The " Mutations " of our Native Land and Freshwater Mollusca,' by J. W. Taylor (Presidential Address), all of which are of particular interest to our readers.

PROFESSOR PRIESTLEY IN CALIFORNIA.

We learn from *Nature* that 'Prof. J. H. Priestley, of the Department of Botany, University of Leeds, is to give a course of post-graduate lectures and demonstrations to students of the Department of Botany and Bio-chemistry of the University of Berkeley, California, during the spring. Prof. Priestley will deal with the subject of developmental anatomy. His lectures will include some account of the work done in the Botanical Department at Leeds upon the structure, function and distribution of the endodermis; the structural features associated with the phenomena of etiolation; and the problem of phototropism.'

COAST EROSION AT YORKSHIRE—CRUMBLING CLIFFS AT ALDBOROUGH.

With the above headings, we learn from *The Times* of January 3rd that 'The severe gales of the past few days have been accompanied by heavy seas which have caused serious damage all along the Holderness sea coast, and particularly at Aldborough. Large pieces of the cliff are falling daily, the force of the sea having undermined them. Farmers are finding their farm lands getting less and less, and in many cases barbed wire fences at the top of the cliff are falling over with the big boulders of clay carrying the supporting posts. The loss of land and property is giving concern to the owners, who, however, are powerless to do anything to prevent the inroads of the sea. At Aldborough, which is a popular seaside resort for Hull people, the erosion is so severe that the owners of wooden bungalows who have been living on the cliff-top are now busily engaged in moving them to a distant part of the village farther away from the sea. Some of the bungalow dwellers, who only visit them occasionally, on their return found them nearly toppling over the cliff-side through a heavy fall of cliff measuring about 200 yards in length. Black House, which was well known to visitors as a restaurant and boarding-house, is now almost at the edge of the cliffs, and it is feared that it will be claimed by the sea, as there is a great crack undermining all that part of the cliff.' Of course, coast erosion goes on each year in Holderness, but the press find it a topic for discussion, reproduction of photographs, etc., about once every ten years.

'HOME CHAT.'

Somewhere about thirty years ago, in a publication called *Home Chat*, the following extraordinary account of this same kind of thing was given from which it will be seen that, except perhaps for a little exaggeration on the part of a much younger journalist, the accounts are very similar:—'At Withernsea, just to the north of Spurn Point, houses go

over the cliff almost daily. Some little time ago, there lived at Withernsea, an old fisherman, who, despite the warnings of his friends, persisted in declaring that the sea would never harm him or his There were two houses between the old fellow's cottage and the crumbling cliff-edge. . . . One rough night, however, a biting nor'-easter hurled the ramping breakers against the shore to such purpose, that first one house went and then the other. Then the wall of the old fisherman's cottage collapsed, because of the disturbance of the foundations ; and he awoke in the grey of the morning to find himself looking straight from his bed on the green waters of the North Sea.'

THE DODDINGTON BORING.

On January 12th, Mr. James Ford, M.I.Min.E., F.G.S., read a paper to the Midland Counties Institution of Engineers on 'The Lincolnshire Coalfield.' The following extracts are taken from a lengthy report in *The Colliery Guardian* of Jan. 21st. The paper is mainly an account of the Doddington or Harley boring, as a result of which 'it is now quite definitely proved that workable coal of excellent quality, at a reasonable depth exists right through into Mid-Lincolnshire. . . . The new coalfield is still quite virgin and of considerable extent. . . . The county of Lincolnshire can now be added to our proved coal reserves and looked forward to as a prospective new mining centre.'

A CONCRETIONARY BRECCIA.

We wonder how many of our readers would guess that the boring is in Nottinghamshire, not Lincoln, a fact nowhere alluded to in the paper; what 'quite virgin' means is problematical, but Mr. Ford claims to have penetrated the coalfield by his boring, and he cannot have it both ways. The lower part of the Permian formation is called 'transition beds . . . very similar to real coal measure beds' but below this comes 'the Breccia, which is a splendid example of this concretionary deposit'; most breccias imply an unconformity rather than a transition, but a concretionary one may of course do anything; it may even deceive a professor of geology, who is reported to have said that if he had not known the rock came out of the coal measures, he would certainly have said it was Millstone Grit.

HALIFAX NATURALISTS.

At its recent annual meeting, the 53rd Annual Report of the Halifax Scientific Society was presented by Mr. J. H. Lumb. The membership had declined from 194 to 183. The average attendance at the lectures was 54. It was stated that the Society was represented at the meetings of the British Association and of the Yorkshire Naturalists' Union. The

natural history section had a membership of 23, and was engaged in recording and tabulating the features of the district, and had room for more workers. The photographic section, which showed the largest membership (86), had been successful in competitions, and allusion was also made to the work of 13 members of the Circle of Microscopy. The Secretary emphasised that the Society's membership was not sufficient for a big town like Halifax. In other scientific circles, both inside and outside the county, constant allusion was made to the work of Halifax men in the past, and it seemed that the old interest in science was not being maintained in the town. Mrs. P. S. Collinge, treasurer, announced a balance in hand of £7 9s. 3d. Mr. H. Waterworth was again chosen president, Mrs. Collidge treasurer, and Mr. J. H. Lumb and Miss Lumb, secretaries, were reappointed. An exhibition of lantern slides followed, and in another room a display of natural history objects was arranged.

PARAMOUDRAS.

In *The Irish Naturalists' Journal* for January, under the heading of 'Grotesque Carvings improperly called Sheela na Gigs,' by H. C. Lawlor, the author describes the way in which these carvings obtained their names, and states 'Here we have an exact analogy to the case where a quarryman in the chalk areas in Co. Antrim was asked by Dr. Buckland if he knew what were the large upright blocks of flint in the chalk. The quarryman, being of an inventive turn, and anxious to please, replied, "Yes, sor, them's 'Padhramoudhras'" (ugly Paddies). The doctor was greatly impressed with a geological term that he (or anyone else) had never heard before, and carefully noted it down. The term is now a classic one in geology, as it sounded to the doctor, "Paramoudras."'

BRITISH ASSOCIATION REPORT.

The Report of the Oxford Meeting of the British Association, held during 1926, was received only a few days after December 31st, consequently strict bibliographers will still have to include the various necessary items in the 1927 lists as well as those for 1926, due to the British Association not being able to fall in with its own recommendation that reprints be not published before the final volume! As we have previously and frequently stated in this Journal, as most of the addresses and reports are in type at the time of the meeting, the issue of the complete volume in the same year should not be an impossible task. We have been assured that this could not be done, but the appearance of the Oxford Report, bound in cloth, within a fortnight after December 31st, leads us to hope that in the future the complete volume may appear during December. We know the Secretary does his best.

SIXTY-FIVE YEARS OF YORKSHIRE GEOLOGY.

E. HAWKESWORTH.

(Continued from page 52).

In 1886, the Yorkshire Boulder Committee (a committee of research in connexion with this Union) was formed, and continued its work for twenty years until, in 1906, its title was changed to 'Glacial Committee.' Summarising its results, the late J. H. Howarth, writes: 'During these twenty years the whole county has been examined, and much of it again and again. It will probably be correct to say that there is hardly an acre of ground, certainly not a square mile, which has not been searched for traces of glacial phenomena, by members of the Committee, and others interested in their behalf. The open moors and fells, the secluded glens and wild mountain gorges, have all been hunted. Railway cuttings, trenches for waterworks, deep borings, drainage operations, brick-works, building foundations—in short, sections of all kinds (many made for the purpose) have been noted and watched with patient and persistent care.* Members of the Geological Survey assisted, eminent petrologists helped in identification of rocks, and the then chairman of the Committee made a special visit to southern Norway to collect rock specimens, and other information, which were of great assistance. The members of the Hull Geological Society paid special attention to the vast accumulation of boulders on the coast, and in Holderness. In one year (1895) the members of this society, who had constituted themselves an East Riding Boulder Committee, made a rough classification of 2070 boulders (over a foot in diameter), noted on the coast between Hornsea and Withernsea, classifying them according to the origin and nature of the rocks, and the exact locality where the boulders were found. In the following year, mostly in Holderness, the same Committee classified over 2600 boulders, on similar lines. The work of the full Committee enabled the boulders originating outside the county to be divided into three main groups—the Western, consisting of rocks from Cumberland, Westmorland, and the Upper Tees Valley; the Northern, consisting of rocks from Durham County, from the Cheviot area, and from Scotland; and the Eastern, consisting of rocks from Scandinavia.

4. GLACIAL.—In the early days of Geology, the deposits of clay, sand, and gravel, which covered large areas of country, afforded a puzzle to scientists, who classed them as diluvium, and could furnish no more satisfactory explanation of their

* *The Naturalist*, 1908.

cause than some traditional universal deluge, an idea which survived with many people long after their real significance began to be recognised. It was not until 1837 that Agassiz, from observations made in Switzerland, was convinced that the glaciers of that country formerly extended over a very much larger area than they then occupied. Buckland, the explorer of Kirkdale Cave, had then published his book, '*Reliquæ Diluvianæ*' (1823), which contained much of scientific value, but his theme was that the alluvium, the cave-earth, and the occurrence of the bones of extinct animals in the caves were due to this deluge. Buckland, who, in 1834, had accompanied Agassiz on a tour of the museums of this country, in order to examine their collections of fossil fishes, on reading of the Swiss conclusions, visited Switzerland to see the evidence for himself, and soon afterwards induced Agassiz to accompany him on a tour through the hilly parts of north Britain, where they found conclusive evidence of glacier action. A new interest was then given to the so-called diluvium, and it gradually became recognised that these deposits were due to ice-action. Ice was accepted as an important factor in geology, but it was many years before any connected history of glacial events was formulated. In the meantime there were fierce controversies between the advocates of valley-glaciers, Polar ice-caps, ice-sheets, with oscillations of the earth's crust, changes of temperature, submergence, and the different causes for each and every set of circumstances.

In the earlier part of the period under review, although boulder-clays, *striæ*, and the more obvious 'erratic blocks' had been noted, geologists had signally failed to discover their proper history and connections. Whilst being agreed that these were due to glaciers and icebergs, and from their lack of knowledge evidently compelled to accept 'a glacial submergence' of the land to the extent of 2000 to 2500 feet, especially to account for the sands and gravels at high altitudes containing marine shells, they were unable to link up all the phenomena displayed by what they termed the 'drift' into a complete sequence of events. After instancing a number of well-known erratic blocks in the British Isles, including the peculiar granite of Wasdale Crag, near Shap, found over all Lancashire, Cheshire, Shropshire, and Staffordshire, and crossing the lower parts of the Pennine Chain, are thence scattered over the Vale of York, one writer states—'The only way in which the presence of these far-transported blocks can be accounted for, is by referring them to the action of ice-floes and icebergs. When our islands were depressed until the mountain tops alone were visible, ice forming along the shores, or the ends of the glaciers which then dipped into the sea and floated off as icebergs, would contain blocks of rock

frozen into them, and these as they melted would drop their freights of blocks from time to time on the sea-bottom. The lower hills, which would at one time form banks or shoals in the sea, would often strand and catch these icebergs, so that the blocks would be left on their summits and sides.*

Five years earlier, another writer gave a similar explanation, in greater detail, and concluded his observations on the subject by stating: ‘And here we may be permitted to remark that many of the difficulties connected with the origin of the glacial drift have arisen from treating it as an anomalous and mysterious formation. Had geologists, instead of looking to abnormal currents and cataclysms, first treated the “boulder-clay” as they did other formations, had they studied more the glacial phenomena of arctic shores, straits and seas, as well as of mountainous regions situated above the snow line, and drawn less on their own invention, had they looked to nature as acting through law, and never through capricious disorder—the drift formation, with all its complicated phenomena, had long ere now been an “established fact” of the science, instead of a medley of perverted observations, respecting which scarcely two geologists entertain the same opinion.’†

The first noteworthy contribution to the Glacial history of our county was made by R. H. Tiddeman, a former president of this Union, who, in 1872, read a paper to the Geological Society on the evidences of glacial action on the north-west borders of Yorkshire and Lancashire, in which he gave numerous records of glacial striae, boulders, and deposits of till and gravels, made by him when acting as officer of the Geological Survey in that area. These afforded proof to him of a widespread and almost universal glaciation, more correctly explained by an ice-sheet, than by any other glacial agent. Under normal conditions this would work down the watershed to the sea, in the direction of the main valleys, but this was not so, the ice-flow was in a different direction, its normal flow having been prevented by a barrier—the great stream of ice coming from the Lake District.

J. G. Goodchild, who, in the course of his work on the Geological Survey, investigated the Vale of Eden and adjacent valleys, on similar lines, paying particular attention to the heavily glaciated country through which the Settle and Carlisle Railway runs, and the sections exposed in its making. He concluded that the upper limit of the ice-sheet here was 2200 to 2400 feet above the present sea-level, and that a line of ice extended along the present watershed of the Lake District to the highest ground in the Yorkshire Dales. To the south

* ‘Manual of Geology,’ J. Beete Jukes, 1881.

† Page—‘Advanced Text-book of Geology,’ 1876.

of this line the ice at high levels flowed straight away over the fells into Lancashire and West Yorkshire, whilst that to the north, after flowing a short distance into the Vale of Eden, was turned east, and compelled to flow over Stainmoor, towards the North Sea.

These two papers, apart from all the other important work done by their authors, are fitting monuments to their genius. The great amount of ground covered in their pioneer exploration, the exact scientific method of their observations, and the lucid manner in which they are recorded, compel admiration, and set an example worthy of imitation by present-day students.

In the Report of the Boulder Committee for 1892, it is stated that 'the Boulder Map of the County on the one inch scale has been mounted, and the mapping of all recorded erratics thereon is in progress.' It would be interesting to know the present whereabouts of this map.

From the great mass of information obtained by the work of this Committee, which not only included the enumeration of the erratics themselves, and their nature, but also their exact geographical position and altitude, together with the recorded *striæ*, it was possible to define the direction and limits of the glaciation of our county, and even over a wider area. For many years the reports of the 'Erratic Blocks' Committee of the British Association contained more observations from our county than any other part of the country, and this valuable contribution to geological knowledge amply justified the appointment of such a Committee, whilst greatly adding to the prestige of our Union.

Through the observations of these, and many other enthusiastic workers, a vast amount of knowledge eventually accumulated, but there had been a marked tendency for each to call in a particular phase of glacial action to explain his own particular patch. One had a glacier here, one an iceberg there, another a sea somewhere else; one even invited the aid of Norse invaders to account for the presence of certain erratics — there was no one to weave the threads together, to form the chapters into a connected story—to join together the links of the chain, or to establish, in a proper sequence of events, a Glacial Period. It was left to Henry Carvell Lewis, a citizen of the United States of America, to suggest an explanation or co-ordination of the Glacial phenomena of the British Isles. Full of experience gained in his examination of the former glaciation of North America, he visited this country, paying special attention to Yorkshire, and was able to connect up most of its glacial features into a complete history, on broad lines, leaving to others the task of filling in the details. One of the past-presidents of our Union, Professor

P. F. Kendall, D.Sc., F.R.S., who had for many years taken more than an active interest in glacial geology, carried on the work, and building on the foundation laid by Lewis, and other American scientists, he was able, after lengthy investigations and research, which resulted in his discoveries of a system of Glacial Lakes in Cleveland, to form a complete story of the Glacial history at least of north-east Yorkshire.

Similar work was carried out by Dr. Dwerryhouse in the valleys of the Tyne and Tees, by Messrs. Jowett and Muff in Airedale, and by others, thus enabling the limits of the various valley glaciers, and the North Sea ice, to be established, and all the consequences of their passage over the country—their effect upon its configuration, the deposits of their load of derived material, their effect upon the drainage, their recession, and final disappearance, to form a complete story, each chapter proving the verity of the other—a story now accepted generally, though one eminent geologist sought to reject it, a few years ago, his main argument being based on an elementary error in geography, and therefore worthless. The story is a most fascinating one, and, as Yorkshiremen, we feel proud that our county, and its geologists, have played so important part in its writing. In our present state of knowledge, it seems surprising that these systems of glacier-lakes were not discovered earlier. Many writers had hinted at a Lake Pickering and a Lake Humber, but failed to realise that, granted an ice-sheet impinging on a hilly or undulating land surface, it must exercise a marked effect upon the drainage of such surface. Thos. Tate, in the report of the tenth year's work (1895) of our Boulder Committee, in reviewing certain observations made near Pickering, concluded that the facts 'pointed rather to an extra-morainic freshwater lake in some way related to the gorge at Ayton, and to the yet more remarkable gorge cut by the river Seven at Sinnington.'

There are still a few small gaps to be filled in, particularly in the explanation of certain deposits and erratics, such as those in the Barnsley area, those south of Doncaster; the gravels on the watershed between Aire and Calder, and pebbles occurring on the country between Aire and Wharfe. It may be that these are the result of an early stage in the glaciation of the country, but no doubt further observations, as opportunities arise, will eventually explain these.

(*To be continued*).

—:o:—

A new series of Solway birds has just been installed in the Carlisle Museum. The collection is the gift of Mr. D. Losh Thorpe, a well-known Carlisle naturalist, and forms nearly a complete series of the waterfowl which visit or reside in the Solway Firth.

FIELD NOTES.

Rook attacking Kestrel.—On January 23rd I was rather surprised to see a Rook persistently attacking a Kestrel at about a height of 200 yards. The Kestrel did not make any attempt to defend itself, but merely tried to avoid or to ward off the blows of the Rook. Two or three times the Rook appeared to get its beak into the Kestrel, but as 'no feathers flew,' it could not have done much harm. The Rook then descended to its more natural altitude, and the Kestrel sailed away.—H. B. BOOTH, Ben Rhydding.

Large flock of Bullfinches at Harrogate.—About noon on January 2nd, I saw the largest flock of Bullfinches that I have ever seen. There would be quite 100, or possibly 130; as many as twenty being in sight at one time. They were in, or rather passing through, the woods of Scotch Pine, on Harlow Hill, Harrogate, just beyond the reservoirs. They were very shy and restless, and were moving in a south-westerly direction, but more in the manner of a large flock of Titmice than of staid Bullfinches. At first, I thought they might possibly be a flock of the larger Northern Bullfinch on migration; but after careful examination with my field-glasses, I made certain they were our ordinary British Bullfinches. They were of both sexes.—H. B. BOOTH, Ben Rhydding.

There would, I think, be more birds than Mr. Booth's highest estimate. They were in the neighbourhood for a few days, and in small parties of from twelve to twenty, for nearly a fortnight. Bullfinches have been rather scarce in this neighbourhood for some years, but their numbers have lately been decidedly on the up grade. A few pairs nest regularly in the gardens of Duchy Road and Kent Road, which adjoin the moor. Few people, I imagine, have been privileged to see such a large flock of Bullfinches.—R.F.

Butterflies near Wigton.—The published lists of Cumberland Lepidoptera contain hardly any references to this district. The following observations were made at Kelsick, about four miles from Wigton, during 1923-5:—*Pieris brassicæ*, scarcely seen during the first two years, but became very abundant during the fine summer of 1925, males greatly predominating; *P. rapæ*, common; *P. napi*, the most consistently common of the 'whites'; *E. cardamines*, common each year from mid-May until the end of June; *A. urticæ*, common; *P. atalanta*, occasionally seen in autumn; *P. megæra*, very common, both spring and autumn broods; *E. ianira*, very common from haytime onwards; *E. hyperanthus*, common in lanes; *C. pamphilus*, *R. phlæas*, *P. icarus*, more or less common, but more abundant on the coast, a few miles to the west. In June, 1923, I saw a small Fritillary, probably *B. selene*, in the village street in Dundraw, but never found its headquarters.—JAS. MURRAY, Gretna.

A FORM-VARIATION IN *RANUNCULUS FICARIA*.

M. A. JOHNSTONE.

Two forms of *Ranunculus ficaria*, differing in one structural particular only, as far as has been ascertained, are constantly being met with. Their occurrence is not obviously correlated with any varying factor, and no theory advanced to account for the difference is beyond dispute.

In the *A* form, the new ground tuber or tubers of the current year are clearly separated from the tuber growth of the previous year by a well-developed internode of the stem. (Figs. 1 and 2.)

In the *B* form, no such length of stem is visible; the two sets of tubers are set quite close together. (Figs. 5 and 7.)

There is a third condition which really is intermediate between *A* and *B*, and which helps to explain the relationship between them. In this the internode is very short indeed—a mere ‘neck’—and is only revealed as present when a longitudinal section is made or the tubers are removed. (Figs. 6 and 10.)

One may also mention here the variation which holds in the hypocotyl of seedlings. In some seedlings there is a length of several millimetres between the base of the primary root and the origin of the plumule immediately below which the first tuber issues. In others, the two are practically in contact. The two cases are not homologous, of course, but it is just possible that the same cause operated in both seedlings and mature plant in producing an analogous form-variation.

Among the explanatory factors which might be regarded as reasonable are these:—

- (1) The status of the plant, as belonging to the *sterile* or the *fertile* group.
- (2) Its origin as from an aerial tuber or a ground tuber.
- (3) As being characteristic of plants of a certain age.
- (4) As being a character imposed by the nature of the soil.
- (5) As being regulated by the depth within the soil at which the budding tuber was situated.
- (6) As being regulated by the degree of freedom which the young shoot possessed at the start.
- (7) As being an inherited character.

Each one of these has been considered, and the evidence material to it has been collected and examined.

*(1) Van Tieghem says very decidedly that the internode is a radical peculiarity confined to young *sterile* plants.

* Van Tieghem, P., “Observations sur la Ficaire,” *Annales des Sciences Naturelles*, 1866, T.V.

Fig. 1.

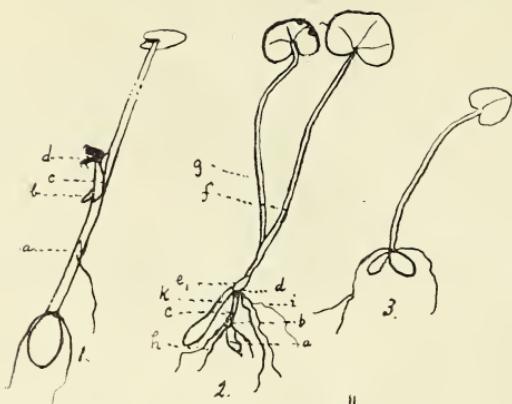


Fig. 2.

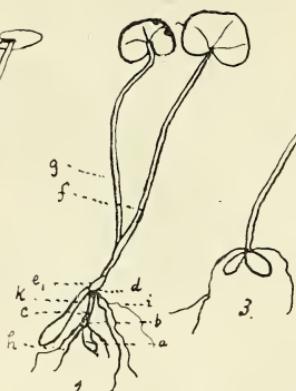


Fig. 3.

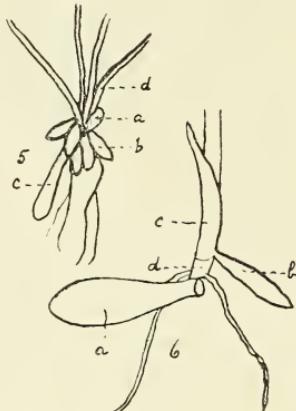


Fig. 4.

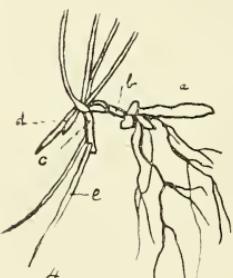


Fig. 5.

Fig. 6.

Fig. 1.—One-year old plant, with internode. (March.)

- (a) Scale and absorptive root in middle of internode; (b) New tuber; (c) Sheathing scale; (d) Second leaf, escaping from base of first, whose petiole is shown as shortened.

Fig. 2.—Second year seedling from experiment. (June.)

- (a) Old tuberous root; (b) Scale, first, from bud on (a); (c) Internode from bud on (a); (d) New node; (e) Scale from (d); (f) First foliage leaf; (g) Second foliage leaf; (h) First set of absorptive roots; (i) Second set of absorptive roots; (k) New tuberous root.

Fig. 3.—Similar plant from same experiment, but no visible internode between (a), the old, and (b), the new, tuber. (June.)

Fig. 4.—Specimen showing outgrowth from tuber.

- (a) Old tuber; (b) Internode; (c) First new tuber; (d) Second and third new tubers; (e) Two outgrowths from (c). Four petioles shown.

Fig. 5.—One year old plant grown from aerial tuber. (Experiment: May.)

- (a) Old tuber, inverted; (b) Seven new tubers, short; (c) First new tuber, long, soil-coated; (d) Four mature leaves.

Fig. 6.—Specimen showing 'neck' condition of internode.

- (a) Old tuber; (b) New tuber; (c) Scale; (d) Internode.

Fig. 8.

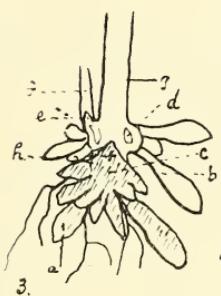
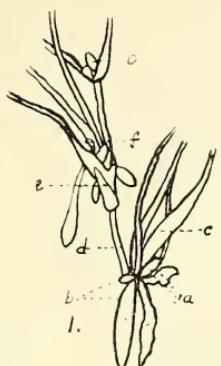


Fig. 9.

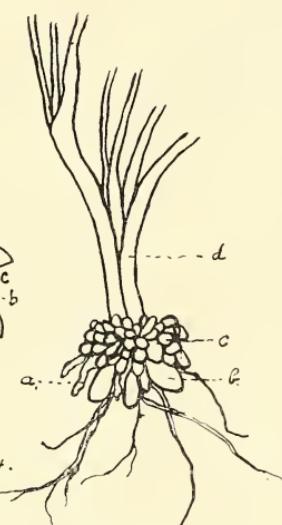
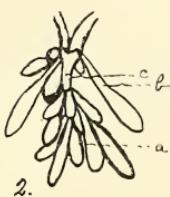


Fig. 10.

Fig. 11.

Fig. 8.—**Sterile plant : without internode.** (May.)

- (a) Old, wrinkled ground tubers ; (b) New ground tubers ; (c) Cluster of leaves rising from ground node ; (d) First aerial internode ; (e) Aerial tubers at two nodes ; (f) Minute leaf, rising amongst tubers.

Fig. 9.—**Relationship of two sets of tubers.**

- (a) Old ground tubers ; (b) New ground tubers ; (c) Internode between (a) and (b), cut to show its branching at the top.

Fig. 10.—**Longitudinal section through specimen in which internode is excessively short.** (May.)

- (a) Old ground tubers ; (b) New ground tubers ; (c) Node from which (a) arise ; (d) Vascular tissue of node from which (b) arise ; (e) Side-bud above node (d) ; (f) Leaf in axil of which (e) lies ; (g) Aerial axis ; (h) Very short regions connecting the two nodes.

Fig. 11.—**A mature tuber cluster.** (June.)

- (a) Old ground tubers (about 20) ; (b) New ground tubers (first, long) ; (c) New ground tubers (short) ; (d) Petioles.

'L'existence de ce premier entrenœud permet de distinguer, dès les premières phases de son développement, le bourgeon qui donnera un pied stérile de celui qui produira une plante fertile.' I am perfectly convinced that it is not so. In one

of my experiments, 15 aerial tubers were set in a garden plot ; they all give rise to sterile plants ; such of these as were uprooted for examination had no internodes : Fig. 5 is taken from one of them. In another experiment, in which the history of an aerial tuber was followed to the second year, there was no internode in either year ; the two sets of ground tubers were in contact ; the internode of the stem which lay



Fig. 7.—**Plant in flowering phase.** (In bud : February).
(a) Old tuberous roots ; (b) New tuberous roots.

above the new tubers was buried (Fig. 15), so that the first pair of leaves with the aerial tubers in their axils rested on the soil. It was a feature of some suggestiveness.

Specimens of mature sterile plants were transferred in 1915 from a wet ditch to a dry spot in a garden. In 1917, one plant examined had the form shown in Fig. 12. It still bore aerial tubers, the lowest being near the ground, as in the case of the above. The lowest internode, normally aerial, was buried ; there was no internode between the new ground tubers (b) and the old (a).

Among many mature sterile plants collected in the course of several years of work no regularity could be detected.

The internode is certainly existent amongst mature sterile plants, but is just as frequently lacking. In Figs. 8 and 12 there is no internode; in Fig. 16 there is an internode.

Reasoning from probabilities, the evidence is against the restriction of the internode to sterile plants. One habitat examined was peopled by sterile plants only; some of the young plants had internodes, some had none; it might be taken as certain that all the young plants were derived from sterile plants and would be sterile plants. This habitat was so situated that the likelihood of tubers or seeds being brought to it from other situations was negligible. To take examples of another kind, many clearly circumscribed clumps were examined, in which scores of tuberlings in their first and second years of existence were very evidently the offspring of one or two older *fertile* plants round which they were centred. Nowhere within half a mile of them at least could a single sterile plant be found. Yet in every one of these clumps plants with and plants without internodes were freely intermingled.

One solitary plant was very instructive. Two young plants were growing from tubers still attached to a fragment of the parent stem; one had an internode, the other had none.

I have not found a trace of evidence which supports Van Tieghem's theory.

(2) Some of the evidence set out under (1) serves also to prove that neither aerial tubers nor ground tubers are restricted to producing either of the two forms. From aerial tubers there may arise plants with or without internodes. The very numerous young plants in the clumps could be derived only from ground tubers. In one such clump all the ground tubers except six were still attached to the parent; of the latter, five had internodes and one had not. Fig. 5 is a non-internodal plant grown from an aerial tuber.

(3) The internode is not a character peculiar to any one year in the plant's history; it may be present at any time, from the first year to full maturity. I have not found out whether a plant which displays the internode in one year necessarily repeats it in successive years. Evidence from plants whose age was known with certainty, they having been grown from tubers, is clear about first year's growth. For example:—

Year of Growth.	Origin.	Form.	Diag.
(a) 1st	Aerial tuber	No internode	Fig. 5
(b) 1st	1st tuber of seedling	Internode	Fig. 2
(c) 1st	Ditto	No Internode	Fig. 3

In (b) and (c) the tubers were grown in pots in absolutely identical conditions, and the tubers themselves appeared to differ in no respect ; and yet one had an internode and the other none. The only material point unknown was whether or not the seeds had come from an internodal plant.

The position of the young plants in some of the clumps referred to above showed that they were first year tuberlings ; others were pretty certainly second year plants, and others looked older still. Internodal and non-internodal were mingled in all ages.

DETAILS FROM ONE CLUMP.

Year of Growth.	Plants with Internodes.	Plants without Internodes.
1st Year	36	6
2nd Year	5	1
3rd Year	3	1

DETAILS FROM TWO OTHER CLUMPS.

Clump.	Internodes present.	Internodes absent.	' Neck ' present.
A	38	42	—
B	69	21	11

Incidentally, the remarkable number of young plants crowded within each mass should be noticed—80 in the one clump and 101 in the other. The clumps were only 3 or 4 inches in diameter.

Older plants which have reached the stage of producing five or six leaves at the tuber-node, but have not entered on the flowering phase, are not exceptions to the rule that internodes are of irregular occurrence.

Specimens of large flowering plants with internodes are seen in Fig. 9 ; without internodes in Figs. 7 and 11 ; with intermediate or ' neck ' region in Fig. 10 ; of mature sterile plants with internode in Fig. 16 ; without internode in Fig. 8.

(To be continued).

—:o:—

Rare Birds in North-east Yorks.—On December 9th, 1926, I saw a Rough-legged Buzzard at Goathland ; on December 2nd a Little Auk was picked up alive near Lowthorpe, near Driffield ; on January 7th, 1927, I saw a Woodlark (*Alauda arborea*) at Goathland (this is quite a rarity up here, the first I have ever seen in this district) ; on January 10th I saw a female Hen Harrier at Goathland.—W. S. MEDLICOTT.

SPECULATIONS ON THE CHARACTER OF THE PALÆOZOIC FLOOR UNDER EAST ENGLAND.

W. S. BISAT, F.G.S.

A PAPER by Dr. Rastall in the *Geological Magazine* for January, 1927, on 'The Underground Structure of East England,' draws attention to the above subject, and is a sequel to an earlier paper by the same author published in 1925, also in the *Geological Magazine*.

In the earlier paper Dr. Rastall summarised and commented on the various trend lines of the principal Midland axes of deformation, and in this later paper he extends his enquiries to the obscure ground lying east of the Charnian axis. He discusses broadly the evidence afforded by the exposures and borings in the Carboniferous rocks of Northern Belgium, Holland and Germany, in addition to that given by borings and sinkings in the Yorks.-Notts. Concealed Coalfield and elsewhere in East England.

It is evident that (as pointed out by the author) the materials available for a reconstruction of the buried Palæozoic floor of Eastern England are very scanty. Reference is made to such recent information as the record of the boring at Doddington, near Lincoln, described by Mr. Fennell at a meeting of the Yorkshire Geological Society at Leeds last year. This boring, which proved 1000 feet of Coal Measures as far east as Lincoln, considerably upset the notion (derived from earlier borings further south in the concealed coalfield) that Coal Measures would prove to be missing in that area.

When a single boring, and that one so close to an already proved area, can so profoundly modify existing conceptions, it is obvious that views on the character of the Palæozoic structure under the North Sea must rest on evidence so slender as to be negligible. Rather boldly, Dr. Rastall suggests as a possibility the extension of the Thuringer Wald-Teutoburger Wald anticlines in a sweeping curve to meet the Market Weighton or the Cleveland axis.

This, of course, may or may not be the case, but in any event a study of the known trend lines of the Midlands leaves one with the impression that a guiding principle governing the occurrence and character of the main lines of deformation still requires finding. For instance, there is the well-known fact of the alignment of the Wharfe anticline and the Market Weighton axis. Here the main facts seem clear, but although the two uplifts are close together, and in alignment, it is difficult to say that the juxtaposition is not mere accident.

Are these two uplifts part and parcel of one story, or are they completely independent, and their alignment the result

of mere chance? They are separated by the Vale of York, which has underlying it Permian beds shewing no trace whatever of thinning, as the crucial line is approached. And yet there does seem to be in the Market Weighton axis, and its flanking basins, a curious echo of the Wharfe anticline and its flanking Carboniferous basins. In each case the uplift separates two basins of deposition, contemporaneous, but with sediments markedly different in phase. In the one case, that of the Craven faults and the Wharfe, the uplift divides the sandstones, shales and coral-yielding limestones of the Yoredales from the Bowland Shales with their thin-shelled cephalopod fauna. In the other case, the Market Weighton axis separates the sandstones, shales and coral reefs of the Cleveland Jurassics from the Oxford plus Ampthill plus Kimmeridge Clays, with their thin-shelled cephalopods. In each case, also, the corals are on the north side of the barrier, and the cephalopod shales on the south. This suggests that there is some connection between the two uplifts, and if this be granted, then the failure of the E.W. uplift, where it crosses the Vale of York, has also probably some significance and is an associated phenomenon.

The need of maps illustrating the geography of Western Europe both in the Carboniferous period and later is very great, but now that the Carboniferous sequence of the various British provinces is becoming better known, these may perhaps soon be forthcoming. The maps of Jukes-Browne in the 3rd Edition of 'The Building of the British Isles' (1911), appear to be the latest available for England, but a more recent map by Delèpine* shews the position and character of the eastern end of the London-Brabant Early Palæozoic massif discussed by Dr. Rastall, and illustrates the tilt downwards towards the N.E. so prevalent during the Viséan period of the Carboniferous.

—:o:—

We learn from the daily press that early in January 'a hawk was seen to seize a weazel in Castle Park, South Cave, near Hull, and fly upwards with it. In a little while both fell to the ground dead. It is believed the weazel killed the hawk in the air and was itself killed by the fall to earth.'

CORRECTIONS:—In Dr. Erdtman's Paper, 'Peat Deposits of the Cleveland Hills,' pp. 39 to 46 of the February Naturalist, the—

Title and explanations of Fig. 3, page 41, refer to Fig. 5, page 45.

"	"	"	4	"	43	"	3	"	41.
"	"	"	5	"	45	"	4	"	43.

* Compte-Rendu du XIIIe Congrès géol. international 1923 (1923)

'La transgression de la mer carboniférieenne et les modifications de la faune au début du Viséen dans l'europe occidentale,' fig. 2.

In Memoriam.

GEORGE TAYLOR PORRITT, F.L.S., F.E.S.

1848-1927.

(PLATE III.).

THE science of Entomology has suffered a great loss by the death, at the advanced age of 78, of one whose fame was widespread, and whose influence and attainments were valued and appreciated throughout the entire country ; and nowhere more than in his native county of Yorkshire. The Yorkshire Naturalists' Union mourns the loss of a former President, and its Entomological Section the oldest member, and one who had been a most active and untiring official and for many years President.

If G. T. Porrit was not born an entomologist he became one at a very tender age. It gave him pleasure to credit the implanting of his love of insects to his nursemaid, who must have been a most intelligent girl, far in advance of her time, and free from those prejudices against

‘things. All legs and wings,
With nasty long tails, arm’d with nasty long stings.’

which, too often, even to-day, characterises, not only nursemaids, but adults of both sexes. She it was who initiated him into the absorbing mysteries of insect biology, by showing him how to rear the tiger moth from the larval stage, and this intimate study of the life history of one of the commonest objects of our countryside, aroused a devotion to entomological pursuits which continued to develop, and dominated his actions to within the last few days of his long, strenuous, and eminently useful life.

He was educated at the Huddersfield College, where he had at one time among his schoolfellows, H. H. Asquith, who, after a distinguished career at the Bar, became a great Parliamentarian, and quondam Prime Minister, and, as Lord Oxford and Asquith, is still with us.

So far back as 1865, when a youth of 17, he made his first contribution to *The Entomologist*. This recorded the capture on the Isle of Anglesea of *Chærocampa celerio*, which has the wrong caption ‘at Huddersfield,’ an error carried forward to the index.

In 1870 he was elected a member of the Entomological Society of London, and, two years later, a fellow of the Linnaean Society. By this time he was rapidly coming to the front as an authority on the Lepidoptera of the county, and was in active correspondence with the principal entomologists of the country such as Doubleday, Newman and Stainton. Early in 1868 he commenced a correspondence

with William Buckler, with whose beautiful and faithful drawings of lepidopterous larvæ he was destined later to become more closely associated.

As an active member of the Huddersfield Naturalists' Society, and of the West Riding Consolidated Naturalists' Societies, he had seen the demise of *The Naturalist*, 1865-7, and also of its shorter-lived successor, *The Yorkshire Naturalists' Recorder*, 1872-3; but undeterred by these failures, he resolved to make another bid for success. The result was seen in the issue of the first number of this magazine, dated August, 1875 :—

‘The Naturalist. Journal of the West Riding Consolidated Naturalists' Society and General Field Club Record. New Series. Edited by Chas. P. Hobkirk and G. T. Porritt, F.L.S.’

The title-page is headed with the apt motto, ‘*Nec temere—nec timide.*’

The joint editors made a success of their venture, and when, in July, 1884, they handed over their charge to Wm. Denison Roebuck, F.L.S., and Wm. Eagle Clarke, F.L.S., they were able to report with satisfaction that not only had their magazine appeared punctually on the first of each month, but that ‘financially, it has always been satisfactory, there having been at the end of every year a small balance in hand.’ Their official connection with the magazine was not severed entirely; as assistant editors they remained until death, that of Mr. Hobkirk in 1902, so that Mr. Porritt’s name has appeared on our title page continuously from August, 1875, until now, a period of fifty-one and a half years.

In 1883 he commenced to publish in *The Transactions of the Yorkshire Naturalists' Union* his ‘List of Yorkshire Lepidoptera,’ which was completed in 1886. This work is a model of its kind, and exhibits his critical acumen and sound knowledge of the subject. A casual glance through its pages is sufficient to show how much the list owes to his own researches and hard work on the order, especially among the lesser-studied micros. A supplement, bringing the whole up to date, was published in 1904. Of late years he had recognised the advisability of preparing a new list, which, besides incorporating the numerous additional records which have accumulated since 1904, should adopt a more modern scheme of classification and arrangement, but felt that such a task should devolve upon one upon whom the years pressed less heavily.

In 1886 the Ray Society published the first volume of ‘*The Larvæ of British Butterflies and Moths*’ from the delicate and faithful drawings of William Buckler, which the

society had acquired after his death. The publication of the work was much delayed by the deaths of the first and subsequent editors, and eventually Mr. Porritt, who had previously declined the responsibility, consented and successfully piloted the last five volumes through the press, the whole nine volumes being completed in 1901.

In 1907 he edited the entomological portion of 'The Victoria County History of Yorkshire,' himself dealing with the Orthoptera, Neuroptera, Trichoptera and Lepidoptera.

His knowledge and his collections were ever at the service of others in the furtherance of science. Many of the notable varieties in his collection were figured in 'The Lepidoptera of the British Islands,' by C. G. Barrett, F.E.S., who drew upon his 'List of Yorkshire Lepidoptera' for the localities of the species dealt with. On the death of Mr. Barrett, in 1904, Mr. Porritt was elected to succeed him on the editorial staff of *The Entomologists' Monthly Magazine*. This was a very great honour to a northern entomologist, and a notable proof of the high esteem in which he was held by his fellow-entomologists.

He was also a member of that very select circle, the Entomological Club.

As a collector he was assiduous and indefatigable. The writer retains a vivid impression of their first meeting at Sherburn on June 2nd, 1884, when Mr. Porritt's activity and keenness in larvæ-hunting were strikingly exemplified.

To the study of Lepidoptera, he, in time, added those of Dermaptera, Orthoptera, Neuroptera and Trichoptera, and of these orders he had almost complete collections. Since the death of Mr. McLachlan he was recognised as one of the very few authorities in this country on the Trichoptera, an order which has never attracted many students.

To the subject of 'Variations in Lepidoptera,' and the problem of 'Melanism,' Mr. Porritt had devoted much attention during many years. Before the Zoological Section of the British Association, held at York in 1906, he read a paper on 'Melanism in Yorkshire Lepidoptera,' which the General Committee ordered to be printed *in extenso*. His wide knowledge of the subject, gained over a long period of field work, made him cautious of formulating any theory to account for the marked spread of melanism during the last forty years, and enabled him to point out the insufficiencies of the various theories from time to time put forward. The last article he wrote was an exposition and criticism of a paper on 'The induction of melanism in the Lepidoptera, and its subsequent inheritance,' recently submitted to the Royal Society by Dr. J. W. H. Harrison and F. C. Garrett.

So far we have dealt with our old friend's career as an

entomologist of national repute. His removal is indeed a great loss when so viewed, but when we come to the narrower confines of our own county, the loss is immeasurably greater. As a member of the West Riding Consolidated Naturalists' Society, which, with a wider scope became the Yorkshire Naturalists' Union in 1877, he played a prominent part in its management, and was President in 1900. In his Presidential Address, delivered at Middlesbrough on the 26th October in that year, he reviewed the history and work of the Union, and after remarking on the great advance which had taken place in the methods of study in the various branches of natural history, how collecting had ceased to be the be-all and end-all of naturalists, he went on to say: 'Far be it from me to decry collectors or collections. Perhaps few in the United Kingdom have during the past thirty or more years been greater enthusiasts over both than myself, and I shall probably continue to be so as long as I am able to do it at all.'

'[Collections] are instruments of civilisation by which our thoughts are widened, apart altogether from the intense pleasure and relaxation with which we regard them, when every specimen brings back to our mind some enjoyable outing, or association, some place, probably a lovely wood or mountain, heath, marsh, river side, or stream where with some friend—probably now gone to his rest—we captured or found these identical specimens.'

This address to the Union was in essence an amplified form of his Presidential Address, delivered before the Huddersfield Naturalists' and Photographic Society on December 17th, 1898, of which he had been a member from the year 1865.

On the formation, December 2nd, 1876, of the Entomological Section of the Yorkshire Naturalists' Union, he was appointed its first Secretary. He was at various intervals, and also for several years past, its President, having been continuously re-elected to that position. For some months he had been in failing health, this prevented him at the last moment from attending the Annual Meeting of the Section at Leeds, on October 30th, 1926. He sent, however, for exhibition, a series of *Hadena pisi* L., from Royd Edge Moors, of an almost uniformly dark purple-brown colour, except for the usual yellow sub terminal line, darker than the type or var. *Scotica*; and a series of melanic *Crambus hortuellus*, in some of which the usual markings were quite obliterated. These were from the Waterloo Tip, Huddersfield.

Mr. Porritt was also a valued member of the South-west Yorkshire Entomological Society, and it is of pathetic interest to note that the very last thing he did before taking to his bed

was to correct the proof of the report of the Exhibition Meeting of this Society, which was held at his house on November 27th. This report, which appeared in our last issue (*ante*, p. 62), gives a concise account of some of the many rarities contained in his rich collection.

In his native town of Huddersfield, where he lived all his life, he was honoured by being co-opted on the Free Public Library Committee, and on the Ravensknowle Museum Committee, on both of which, especially the latter, he did much valuable work, and freely gave of his time and of his collections, as well as expert assistance and advice.

A Yorkshireman through and through, calling a spade a spade ; he was totally devoid of all snobbishness, as he himself put it : ‘ In our field meetings everyone meets on equal footing, and in the mutual intercourse between class and class it is inevitable that each will find out the good qualities of the other, and admiration of, and respect for these completely oust in the one those paltry and contemptible notions of superior caste so largely prevailing now-a-days, and in the other those prejudices which often, not without reason, they have been accustomed to regard them.’

In the fullest spirit of this expression of his opinion it gave him intense pleasure to exhibit his collections, and to point out the rarities, distributing duplicates, and giving freely of the knowledge gained in many years of study. Everyone was warmly welcomed, and soon made to feel thoroughly at home, and it would be difficult to say which experienced the greater pleasure, the host or his visitors, who would often be drawn from that grand type, the working-man naturalist, which has done so much in building up our knowledge of the local flora and fauna.

His death occurred on January 21st, in a nursing home after an operation. He leaves three daughters and one son, to whom we offer our respectful sympathy.

The funeral took place at Edgerton Cemetery on the 25th. In addition to the family and friends, and representatives of the numerous public bodies with which he had been connected, the Yorkshire Naturalists’ Union was represented by Dr. Woodhead and Mr. C. A. Cheetham, F.E.S., and also sent a wreath for the grave. It is not easy to realise that we shall no more hear the brusque voice, nor feel the hearty handshake, nor see the initials G.T.P. at the foot of some thought-inspiring article. But so it is, and we are fain to say of him, as he said of Henry Doubleday more than fifty years ago : ‘ He is gone, but has left behind him a memory beloved by every one. Men like him are scarce in these days, and Entomology can ill spare such a one.’—E. G. B.

In Memoriam.

JOSEPH DARKER BUTTERELL.

WE much regret to record the death of an old and valued friend, Mr. Joseph Darker Butterell, of the Manor House, Wansford, East Yorks., at the age of 74. In the early days of the Yorkshire Naturalists' Union, in association with W. Denison Roebuck, W. Nelson, and J. W. Taylor, he did much to forward the study of Conchology in the county; and was one of a small band of enthusiasts whose work has since brought Conchology as a science to such prominence throughout the country. An ardent microscopist, he was successful in mounting the radulæ, or ribbons of microscopic teeth which occur in the mouths of snails, his preparations being delightful examples of painstaking work, and forming very beautiful microscopic objects. His knowledge was put to the service of Mr. J. W. Taylor, and used in connection with his well-known monograph.

In the days of the old Beverley Naturalists' Society, Mr. Butterell acted as Secretary, and years ago attended frequently at the excursions and indoor meetings of the Yorkshire Naturalists' Union, taking part in the organisation of excursions into the East Riding. The pages of *The Naturalist* and the old programmes issued by the Union, contain references to his work, and while in recent years he lost none of his interest in natural science, opportunity did not enable him to follow his hobby as formerly, though he devoted much time to gardening, and was exceptionally successful in rearing many rare and beautiful plants.

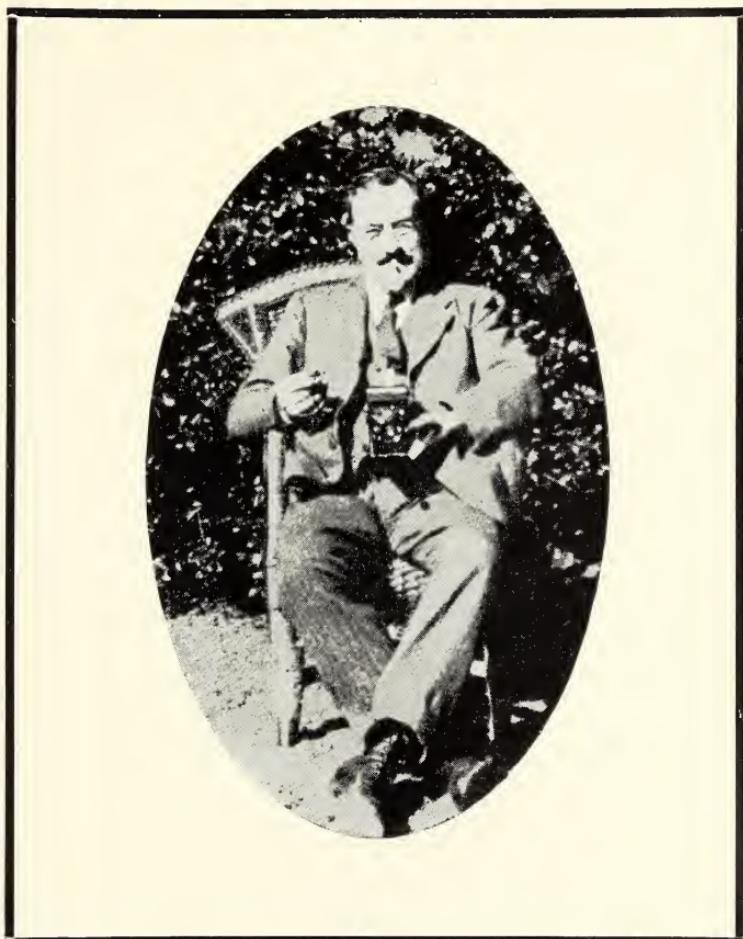
Mr. Butterell was in business in the centre of the city of Hull, and well-known and respected as an expert estate agent and valuer, accountant and auditor. He leaves a widow and two sons and three daughters, to whom we extend every sympathy.—T.S.

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A paper on 'Glacial Tectonics as reflected in disturbed Drift Deposits,' by G. Slater, based on observations in Norfolk, Cheshire, etc., appears in the *Proceedings of the Geologists' Association*, issued on Dec. 21.

Among many valuable contributions to *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. LXX., are 'The Life and Work of George Everard Rumphius,' by S. J. Hickson; 'Regional Survey of Manchester and District: The Vertebrate Fauna,' by T. A. Coward; 'The Brains of Apes and Men,' by G. Elliot Smith; 'Facetted Pebbles in the South Manchester District,' by J. W. Jackson and O. T. Jones.

Dr. Alexander Meek favours us with a copy of the *Report of the Dove Marine Laboratory* at Cullercoats, Northumberland, for the past year. The Editor writes on 'Plankton Investigations,' and on 'The Currents of the East Coast'; R. Gill deals with 'The Flesh Protein of Herring,' and 'The Pollution of the River Tyne'; Dorothy Cowan describes 'The Growth of the Lumpsucker and the size (of Herrings)'; B. Storror writes on 'Herring Shoals.'



Joseph Darker Butterell.

DIPTERA FROM MIDDLEHAM.

CHRIS. A. CHEETHAM.

THE following lists of additions to the Diptera of V.C. 65 indicates that Coverdale was the best collecting ground for diptera on the occasion of the Union's excursion to Middleham last August. The number of additions to the vice-county list from the Penhill and Coverham area is somewhat surprising, as the writer has collected in this place at a similar date on more than one occasion, and always met with good results.

The * denotes additions to the Yorkshire list, and the initials (J.E.C.) signify that Mr. J. E. Collin, F.C.S., has kindly identified these species for me.

COVER BANKS.

<i>Tipula paludosa</i> Mg.	<i>Graphomyia maculata</i> Scop.
<i>Hemerodromia melanocephala</i> Hal.	<i>Phaonia signata</i> Mg.
<i>Sympycnus cirrhipes</i> Wlk.	<i>Balioptera triplunctata</i> Fln.
<i>Sphegina clunipes</i> Fln.	<i>Phytomyza affinis</i> Mg.

PENHILL AND COVERHAM.

* <i>Zygoneura sciarina</i> Mg.	<i>Syphus corollae</i> F.
<i>Diadocidia ferruginosa</i> Mg.	<i>Melanophora ruralis</i> L.
<i>Allodia crassicornis</i> Stan.	<i>Mydaea lucorum</i> Fal.
<i>Dicranomyia didyma</i> Mg.	<i>Trichopticus hirsutulus</i> Ztt.
<i>Molophilus bifarius</i> Verr.	<i>Azelia macquarti</i> Staeg.
<i>M. bifidus</i> Goet.	<i>Pegomyia bicolor</i> Wd.
<i>Ormosia pseudosimilis</i> Lnstr.	<i>Hylemyia lasciva</i> Zett.
<i>Limnobia quadrinotata</i> Mg.	* <i>Limnophora exsurda</i> Pand. (J.E.C.)
* <i>Gonomyia recta</i> Tonn.	* <i>Spilogona brunneisquama</i> Ztt. (J.E.C.)
<i>Dicranota bimaculata</i> Schum.	<i>Coenosia rufipalpis</i> Mg.
<i>Dixa puberula</i> Lw.	* <i>Suilla (Helomyza) affinis</i> Mg. (J.E.C.)
<i>Tipula cava</i> Riedel.	<i>Neoleria (Blepharoptera) inscripta</i> Mg.
<i>Hilara matrona</i> Hal.	<i>Heteroneura albimana</i> Mg.
<i>Tachista arrogans</i> L.	<i>Themira pusilla</i> Ztt.
<i>Sympycnus ænicoxa</i> Mg.	<i>Trineura velutina</i> Mg.
<i>Ardoptera irrorata</i> Fal.	
* <i>Tachydromia pallidiventris</i> Mg. (J.E.C.)	
<i>Dolichopus vitripennis</i> Mg.	

WALDENDALE.

<i>Boletophila saundersi</i> Curt.	<i>Microchrysa cyaneiventris</i> Ztt.
* <i>Phronia tarsata</i> Staeg.	<i>Platychirus immarginatus</i> Ztt.
<i>Mycomya wankowiczi</i> Dz.	<i>Helophilus pendulus</i> L.
<i>Mycetophila marginata</i> Winn.	<i>Lydina ænea</i> Mg.
<i>Tachydromia coarctata</i> Collin (J.E.C.)	<i>Pyrellia eriophthalma</i> Mcq.
<i>Rhamphomyia hybotina</i> Ztt. (J.E.C.)	<i>Tephritis miliaria</i> Schrk.
	<i>Cetema (Centor) elongata</i> Mg.
	<i>Scaptomyza gramineum</i> Fln.

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The Jubilee number of *The Mineralogical Magazine* contains a portrait of its first President, Henry Clifton Sorby.

**THE YORKSHIRE NATURALISTS' UNION'S
SIXTY-FIFTH ANNUAL REPORT
FOR 1926.**

(Continued from page 58),

Fruiting in 1926.—Observation on the Beech in the N.W. of the county seems to show that it is the ‘one tree which has fruited well,’ but writing from Huddersfield, Mr. Wattam says ‘only poor’; and again Mr. Haley’s Dewsbury report says ‘beech flowered and fruited well, but most of the “masts” (nuts) are devoid of seed.’ The Cowling notes make out ‘Beech fruit’ to be an ‘excellent crop.’

Reports on the Oak vary very considerably with the locality, from fair in the East Riding to perhaps good or very good in the North and West Ridings. Hazel, which flowered in very great profusion and early, is reported in nine out of ten localities to have an excellent crop of nuts.

The solitary instance is the Huddersfield district, where the crop is said to be ‘only poor.’ The Mountain Ash in most localities has made an excellent display of berries, while at Cowling ‘very few persons have seen a berry.’ A North Riding correspondent writes that the fruits of Mountain Ash have been prolific, but the ‘birds took them early.’ In the case of Holly the reports are also variable. At Nidd, near Knaresborough, and on Oxenber, Holly gives every promise of a wonderful show, while at Huddersfield ‘fruit is most sparse,’ and at Cowling ‘it varies, but on the whole is below average.’

Hawthorn flowered somewhat irregularly, some trees being white over, while others had no blossom; and the crop of ‘haws’ is quite in keeping, being fairly good, *i.e.*, considerably better on the whole than that of 1925.

Of Apple, both ‘crab’ and cultivated, the reports are very conflicting, but generally the crop is a little better than that of last year in both cases.

Pear, which always flowers earlier than Apple, is variously reported on, but in the East Riding Yorks. the crop is good, many trees being heavily laden.

Of the Pruni—Sloes, Plums, etc.—the very cold spell which followed the copious blossoming, almost completely prevented fertilisation or killed the fruit in its incipient stages; so there are no Sloes, Bullaces, or Plums, or very few. Cherries were a rather poor crop, although the Gean flowered abundantly and cropped very well. Bird Cherry, a later flowering species, had only a moderate crop of its black astringent fruits.

Brambles have again an excellent crop everywhere, partly due, we believe, to late flowering. Raspberries, both wild and cultivated, blossomed profusely, as did Blackcurrants, also about Easter, the first week of April, but neither fulfilled the promise of fruit, the crops generally being very poor indeed. On Cloudberry fruiting, Mr. Wattam remarks, that it was an ‘absolute failure,’ which is somewhat inexplicable for the species does not flower till June. Probably the comparative dryness of the high moors has had something to do with the Cloudberry’s conspicuous lack of fruit this summer.

Roses, both in garden and hedgerow, have done well at flowering this season, and the fruits, Dog Rose and Field Rose, are abundant; *Rosa villosa* and others of the downy group are not so well fruited. But the flowers of these did not appear to us at the time to be in any great profusion.

Summarised it may be taken that there were from very good to ex-

cellent crops generally of Mountain Ash, White Beam, Wild Service, Bramble, Rose, Elder, Mulberry, Hornbeam and Yew.

From very fair to good was the fruitage of Hawthorn, Cherry, Gean, Cultivated Apples, Pear, Horse Chestnut, Sycamore, Hedge Maple, Lime, Walnut, Holly, Guelder Rose, Oak, Beech and Birch.

Below par, very poor, or almost nil in a few cases, must be said of Blackthorn (Sloe), Plum, 'Crab,' Raspberry, Bilberry, Ash and Elm.

Again it is satisfactory to show appreciation of the very large space given to Botany in the pages of *The Naturalist*. Not only this, but the names, among others, of Professor Priestley and Dr. G. C. Druce are guarantees for the quality and value of the articles that have appeared.

Botanical Survey Committee (W. H. Burrell) :—During the year observations were made at the field meetings, and a study of Spurn was made by Mr. John Grainger. The notes published in *The Naturalist* will allow future comparisons to be made. Attention is directed to a paragraph in *The Naturalist*, 1926, p. 295, reporting Sir Daniel Hall's desire to see parish maps in the village schools. Soil and vegetation mapping might provide training for naturalists, giving a definite objective, not difficult of achievement, for lack of which good intention often fails to produce results.

Bryology (F. E. Milsom) :—Among the outstanding events of the year, the visit of the British Bryological Society to Ingleton at Whitsun must be noted. Many interesting plants were found, and some points, long in dispute, were cleared up. Reference may be made to Mr. Burrell's note in *The Naturalist* for details. The sectional reports, also in *The Naturalist*, give accounts of work done during the year.

The range of distribution of *Orthodontium gracile* var. *heterocarpum* is still being investigated, and has been extended by the discovery of its presence on trees at Fenwick. The only other record of this moss in such a habitat is that made at Coxley Valley last year.

Scapania Bartlingii is a rare hepatic found in a new locality near Thornton Force, Ingleton.

Mr. H. H. Knight mentions that he usually finds it in company with the lichen *Solorina spongiosa*.

Many instances of such moss and hepatic associations occur, and not only are they valuable field hints, but they direct attention to the rather neglected ecological aspect of bryology.

Mycology (A. E. Peck) :—Mr. Mason is performing valuable service in revising the county records.

I am afraid that the more fragile fungi such as the Agarics with dark spores and our delicate Mycenas receive only poor attention. It is so much easier to deal with robust specimens which stand transport well. The small and fragile so often reach the workroom in badly damaged condition. Thus records for years past will certainly show a heavy proportion of white-spored agarics. Granted these form the most numerous class, and possibly the most popular class, yet the proportion in our annual records can scarcely be justified.

Committee of Suggestions (Chris. A. Cheetham) :—The two lines of study initiated by this Committee are still being steadily pursued.

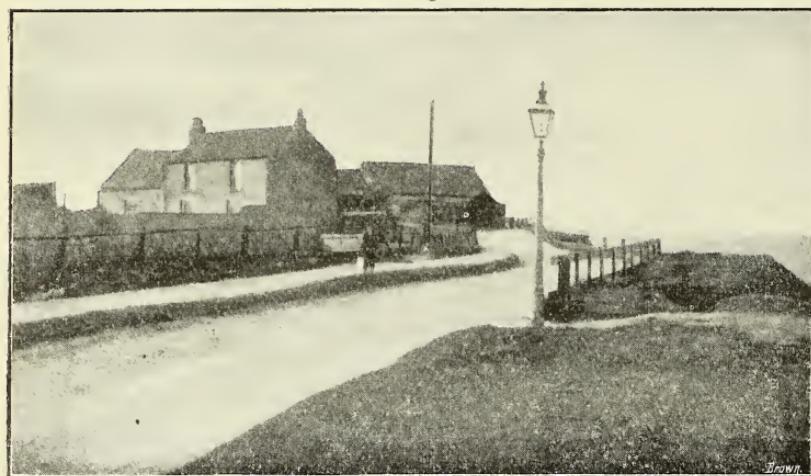
The Rivers Survey is mainly in the hands of Messrs. Percival, Whitehead, Brown and the West Riding Rivers Board, who are working on a definite line of research. A meeting held on December 2nd at Leeds University discussed a report which will probably appear in *The Naturalist*.

The peat question has loomed large in *The Naturalist*, mainly through the visit of Dr. O. G. E. Erdtmann; it is evident from a paper by Woodhead and Erdtmann that there is as yet no agreement as to the age of our peat deposits, and help in this matter would be very welcome. Until lately it has been assumed that the Roman roads were below the peat, but in this article the horizon of the Blackstone Edge road is

placed higher up, in the peat. A series of sections carefully made in widely separated places and on different roads would show how the matter really stands. Cannot this be done by our Union?

Coast Erosion (T. Sheppard):—As usual, there has been a large crop of reports of the extensive damage to the Yorkshire Coast, notably near Kilmington, at Rimsell, near Withernsea, and at Cowden. In April the Humber Conservancy Board reported that the average monthly erosion of the foreshore between Crabley and Brough, on the Humber, was 1 ft. 9 in., during the preceding six months, the total being 10 ft. 6 in. The area of land at Brough Growths had been reduced by erosion from 21 acres to 15½ acres, and the rents were reduced accordingly. The accompanying illustrations show near and distant views of damage to the farmstead at the edge of the cliffs at Rimsell, immediately north of Withernsea, and copies have been sent to the Geological Photographs Committee for preservation.

To illustrate the change that has taken place recently, we reproduce



All that is left of Waxholme.

herewith a photograph of the same set of buildings which appeared in 'The Lost Towns of the Yorkshire Coast,' 1912, page 152. This shows the old roadway, which formerly went straight along, being diverted to the left towards the farmyard, and this diversion, as well as the buildings shown in the photograph, have since disappeared.

Glacial Committee (J. W. Stather):—Extensive excavations at Paull have yielded a portion of the skull and horn core of *Bos primigenius*, this being a new locality for mammalian remains in the Holderness gravels. Very careful search for the fresh-water *Corbicula fluminalis* has been made in this section, but without finding a single trace of the shell, though it occurs literally in hundreds in the similar gravels at Burstwick and Kelsey Hill only four miles to the east.

Thanks to extensive quarrying operations, good sections in the Holderness glacial gravels are now available—at Paull Holme, Kelsey Hill, Burstwick, Catwick, Brandesburton and Barmston. Coney Garth, near Brandesburton, which was a conspicuous landmark, has quite gone, and the well-known Kelsey Hill, near Burstwick, is now a fragment of its former self.



View showing the farm house at Rimswell, immediately north of Withernsea, on the cliff edge.



Near View, showing damage to out-building.

Geological Photographs Committee (Major A. J. Stather) :—The following prints have been added to our collection :—

By Mr. W. H. Stather :—The Source of the Derwent, Wykham High Moor ; Tabular Hills, Langdale End ; Cliff sections at Hawsker Bottoms ; Perched Blocks on Hawsker Beach ; Blocks of 'Dogger' on Saltwick Beach ; Several prints shewing the remains of the moraine mounds at Brandesburton and Catwick, Holderness ; Large Shap Boulder on Dimlington Beach.

By J. W. Stather :—Large Ammonite, Middle Chalk, S. Ferriby ; Faulted Chalk with Marl Band, S. Ferriby ; Blocks of Estuarine Sandstone with footprints, on Beach north of Cromer Point.

By T. Sheppard :—The original photographs showing recent coast erosion at Withernsea, which are reproduced in the accompanying report on Coast Erosion.

(*To be continued*).

—: o :—

Part IX., and presumably the final part, of 'The Food of some British Wild Birds,' by Dr. W. E. Collinge, contains a portrait of the author.

An excellent account of the life and work of the late G. W. Lamplugh, with a portrait, appears in *The Proceedings of the Royal Society*, 1926, from the pen of Sir Aubrey Strahan.

The Avicultural Society (we learn from *The Avicultural Magazine* for January) is in its 33rd year, and the list of six original members includes the name of a past-president of the Yorkshire Naturalists' Union, Mr. W. H. St. Quintin.

In a report of a meeting of one of the Archaeological Societies in the provinces, the chairman is said to have stated : 'Among the collections in their museum was the rare Saxon bath he had given them, which was one of the finest gifts ever made to any provincial museum (cheers).' We can quite understand the cheers !

The Halifax Scientific Society keeps up an interest in its work by having an exhibition in connection with its annual meeting. This year it was held in the Bankfield Museum, when photographs, microscopic objects, various natural history specimens and lantern slides were exhibited by different sections of the society.

Some valuable additions to the small library of reports and papers dealing with the Fishing Industry, now being gathered together in the Museum of Fisheries and Shipping at Hull, have been presented by Messrs. Richard Elmhirst, A. P. Orr, J. Stephenson, and Miss Sheila M. Marshall. These deal with various forms of sea life : The Nitrite Content of Sea Water ; Feeding Habits of the Sea Anemone ; Food of *Calanus finmarchicus*, etc.

Mr. Hans Schlesch sends a pamphlet containing the following articles reprinted from *Archiv für Molluskunde*, Vol. LIX., for 1927, 'Ueber Abnormitäten der Farbung, der Windungsrichtung und der Gehäusebildung bei den Clausiliiden' ; 'Kommt Cyraulus (Gyraulus) gredleri (Bielsz) nicht mehr lebend in der Lienzer Gegend vor?' 'Hydrobia jenkinsi Smith subfossil in Kurland' ; and 'Beitrag zur Molluskenfauna von Dänemark, Ermelunden und Ordrup Mose bei Kopenhagen.' It is illustrated with some excellent plates.

We are pleased to find that a second edition has been called for Volume X. of the 'Special Reports on the Mineral Resources of Great Britain,' dealing with Iron Ores—The Haematites of the Forest of Dean and South Wales (101 pp., 2/- net). It describes the mode of occurrence of the haematite ores of the Forest of Dean and those at the outcrop of the Carboniferous Limestone in South Wales. Although the Forest of Dean has been exploited for its iron ore since the Roman occupation it is not yet completely exhausted, and the ore-field gives promise for further development by modern methods.

NEWS FROM THE MAGAZINES.

We should like to congratulate *Nature* on commencing its Volume 119 on January 1st.

Dr. J. W. Heslop Harrison writes on 'The Induction of Melanism in the Lepidoptera and its Evolutionary Significance,' in *Nature* for Jan. 22. *The Museums Journal* for January has a well-illustrated editorial on 'A Commercial Museum' with four illustrations of Hull's fifth museum.

H. C. Long continues his well illustrated account of 'Poisonous Plants of the Farm,' in *The Journal of the Ministry of Agriculture* for January.

'Flapper Shooting' is discussed in the winter number of *Bird Notes and News*—let us hasten to add that 'flappers' are ducks not sufficiently feathered to be able to fly.

Two new species of Lower Carboniferous Brachiopoda from Northumberland are described by Helen M. Muir-Wood, in *The Annals and Magazine of Natural History* for February.

A valuable record of River Pollution and Fisheries occurs in *Nature*, No. 2983, where also A. E. Boycott and C. Diver write on 'The Origin of an Albino Mutation in *Limnaea peregra*.'

The Museums Journal for February contains a record of 'The Exhibit at the Science Museum of the Work of Adhesives Research Committee of the Department of Scientific and Industrial Research.'

We learn from *The Museums Journal* that an Imperial Chinese umbrella has been presented to the Leeds City Art Gallery, though the notice appears under the heading of 'Leeds Museum.'

The Colliery Guardian for February 4th contains a paper on 'The Sinking of Two Shafts by the Freezing Process at the Londonderry Colliery, Seaham Harbour, Co. Durham,' by J. L. Howard.

Nature, No. 2981 contains a Cavendish Laboratory Supplement, with portraits of James Clerk Maxwell, Lord Rayleigh, Sir J. J. Thomson, and Sir Ernest Rutherford, as well as photographs of the workrooms and apparatus.

In *The Annals and Magazine of Natural History* for January, R. G. S. Hudson and Margery I. Platt figure and describe a new genus and new species of coral, *Rylstonia benecompacta*, based on specimens from near Rylstone, Yorkshire.

In *British Birds* for January, Mr. W. K. Robinson describes a bird, which, after 'a bit,' rose, and with 'a sort of' half twist, etc., was, 'without any doubt,' a Hawk-owl. The editor, however, puts 'probable' Hawk-owl in Middlesex as the heading!

James Ford writes on 'The Lincolnshire Coalfield' in *The Colliery Guardian* for January 21st, and gives a sketch map showing the positions of the borings, and a detailed record of the strata passed through in borings at Harby to a depth of 1201 yards.

In *The Quarterly Journal of the Geological Society* (No. 328), Mrs. J. Longstaff gives 'A Revision of the British Carboniferous Murchisoniidae, with Notes on their Distribution and Description of some New Species,' in which several northern forms are figured and described.

Under the head of 'Prehistoric Mammals of Ireland,' Mr. H. E. Forrest, in *The Irish Naturalists' Journal* for January, describes collections from a large number of English deposits, notably Kent's Cavern; Creswell Caves; and others in Derbyshire; The Mendips; Gower Caves, etc.

Dr. W. E. Collinge writes in *Nature*, No. 2982, on 'Sea-Birds: Their Relation to the Fisheries and Agriculture,' and concludes: 'As a result of this investigation, and the expression of opinion of those who have devoted a lifetime to fisheries investigation, we are of opinion that no action of sea-birds can produce any appreciable effect upon the plenitude of the fishes of the sea. Moreover, many of the species of birds are exceedingly valuable from an agricultural view-point, and their wholesale destruction may be fraught with the gravest possibilities.'

Some eggs laid by stick insects have hatched in the Peterborough Museum.

Sir William Boyd Dawkins has been a Fellow of the Geological Society for sixty-six years.

Professor A. G. Tansley, F.R.S., has been elected to the Sherardian Professorship of Botany at Oxford.

In Hirst Buckley's *Annual* for 1926, printed at Scissett, Mr. B. Morley writes on 'Where do Flies go in the Winter Time?'

R. W. Goulding adds to his many important antiquarian pamphlets by producing a well-illustrated account of 'Margaret (Lucas), Duchess of Newcastle.'

Mr. J. W. Jackson, M.Sc., F.G.S., of the Manchester Museum, has been elected President of the Manchester Geological Association in succession to Professor O. T. Jones.

The British Museum (Natural History), has received from Mrs. Stebbing several thousand Crustaceans collected by her late husband, the Rev. T. R. R. Stebbing, F.R.S.

A minute species, *Ammonites nanus* (now *Tragophylloceras nanus*) from 'probably Lower Lias [near Whitby]' and *A. fibulatus* (now *Peronoceras fibulatum*, from Whitby), are figured in S. S. Buckman's *Type Ammonites*, Part LXI.

Photographs have now been received of the alleged Pithecanthropus skull from Java, which, it will be remembered, was positively announced to be a primitive type of human being. They clearly indicate that the object is a skull of a Pleistocene elephant.

The birds, butterflies and general natural history of Kenya and Uganda are the subjects upon which there are three important monographs in *The Journal of the East Africa and Uganda Natural History Society*, which is edited by Dr. V. G. L. van Someren (pp. 197-245, 10/-).

At last one of our three Entomological journals has recognised that there is a journal called *The Naturalist* which for years has systematically drawn the attention of its readers to the more interesting contents of those three journals. We have to thank the editor of *The Entomologist* for the note in his January issue on '*The Naturalist*, 1926.'

The Vasculum for January is quite up to the usual standard, and contains, among others, the following articles: 'Minerals of the North Country,' by J. A. Smythe; 'Phenology,' by J. E. Clark; 'Town Planning and the Nature Lover,' by H. A. Mess and G. W. Temperley; and 'Experiments on the Variegation of Plants,' by F. W. Sansome.

Mr. Heron-Allen has presented his collection of Foraminifera as well as that formed by Mr. Earland, to the British Museum (Natural History). The collection, which numbers between seventeen and eighteen thousand slides, includes the Millett, Siddall, Sidebottom, and other notable collections, and is undoubtedly the largest and most complete in the world.

A fine 'Cumbrian' type of polished celt, weighing over 4½ lbs., and 12½ inches long, has recently been found near Onston Hall, Cheshire, and is figured in *The Antiquarian Journal* for January. It is apparently made of Borrowdale ash. We learn that 'the distribution of these large "greenstone" implements justifies the opinion that they belong to the area known as Cumbria, and the type is assigned on Scandinavian evidence to the period of the dolmens, about 2500-2000 B.C.'

Messrs. H. F. & G. Witherby have sent us Part VI. of *The Journal of the Society for Preservation of the Fauna of the Empire* (98 pp.), which includes reports on such important subjects as the 'Tsetse-Fly Campaign in S. Rhodesia'; 'Game Ordinance, Tanganyika Territory,' by C. F. M. Swynnerton; 'Conservation of Malavan Fauna,' by T. Hubbock; 'The Zululand Game Reserves,' by C. W. Hobley; 'Kenya Colony, Game Warden's Report, 1925'; 'Uganda Protectorate, Game Ordinance, 1926'; 'Elephant Seal—Reservation of Guadalupe'; and 'Otter and Badger Hunting,' by E. F. G. Meade-Waldo.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

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The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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GEOLGY EXCURSIONS ROUND THE ISLE OF WIGHT (3rd Ed.). G. A. Mantell.

COAST SAND DUNES, SAND PITS AND SAND WASTES. C. O. Case.

HUGH MILLER: A CRITICAL STUDY. W. M. Mackenzie.

COAL AND WHAT WE GET IT FROM. R. Meldola.

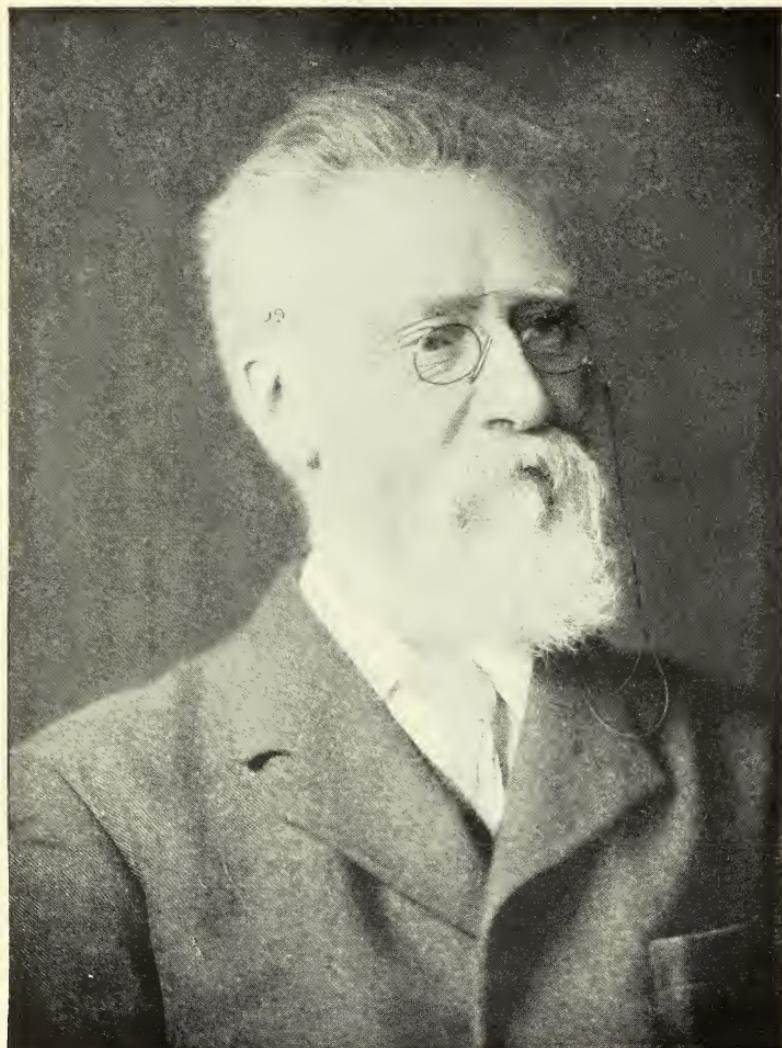
RAIN AND RIVERS. G. Greenwood.

THE OLD RED SANDSTONE. Hugh Miller.

Apply :—Dept. 'C,' c/o A. Brown & Sons, Ltd.

The Naturalist, 1927.

Plate V.



Prof. P. F. Kendall, D.Sc., F.R.S., F.G.S.

NOTES AND COMMENTS.

PROF. P. F. KENDALL.

In *The Colliery Guardian* for Jan. 7th is a supplementary plate containing a photograph of Prof. P. F. Kendall, D.Sc., F.R.S., F.G.S. (as Plate V.), in the series devoted to 'Men of Note in the British Coal Industry.' This is accompanied by the following letterpress: 'Professor Kendall is probably best known to the mining world for his remarkable prophecy with regard to the eastern extension of the Yorkshire, Derbyshire and Nottinghamshire coalfields, in connection with the Royal Commission on Coal Supplies in 1905. He then indicated an area where it was possible for coal to be worked, an area which was not accepted by H.M. Geological Survey and other experts. Subsequent borings, and particularly some made quite recently, have confirmed the accuracy of Professor Kendall's bold suggestion that the concealed coal-fields extended practically across Lincolnshire. For many years he has been an expert advisor in connection with salt-mining, water supply, and coal questions. His position for many years as Professor of Geology at the Leeds University brought him in touch with the proprietors of the collieries of Central England, many of whom have made valuable presents to the Leeds University in recognition of Professor Kendall's services to them. He is the author of many works dealing with glacial and general geology of Yorkshire and other areas, but probably his greatest gift is one of "enthusing" students and others with whom he comes in contact. There are geologists in every quarter of the globe to-day who owe their first interest in the science to Professor Kendall.'

THIRTEENTH CENTURY WHALING.

Mr. C. Davies Sherborn sends the following extract from 'Travels of Marco Polo,' Book III., Chapter 35, 1271-1299, which is the earliest reference to whaling and harpoons that we remember seeing. Of the Island of Soccotira (Socotra) :— 'upon leaving these islands (? Abd-al-curia), and proceeding five hundred miles in a southerly direction, you reach the island of Soccotira, which is very large and abounds with the necessities of life. The inhabitants find much ambergris upon their coasts, which is voided from the entrails of whales. Being an article of merchandise in great demand, they make it a business to take these fish; and this they do by means of a barbed iron, which they strike into the whale so firmly that it cannot be drawn out. To the iron a long line is fastened with a buoy at the end for the purpose of discovering the place where the fish, when dead, is to be found. They then drag it to the shore, and proceed to extract the ambergris from its belly, whilst from its head they procure several casks of oil.'

EARLY REFERENCE TO A CLOSE TIME FOR GAME.

It is not generally known that the celebrated Tartar, Khan Kublai, instituted a close time for game in Northern China as early as about 1275. The reference to this edict will be found in 'Marco Polo,' Book II., Chapter XVI. (Everyman's edition), and runs in English as follows:—'There is an order, however, which prohibits every person throughout all the countries subject to the Grand Khan, whether prince, nobleman, or peasant, from daring to kill hares, roebucks, fallow deer, stags, or other animals of that kind, or any large birds, between the months of March and October; to the intent that they may increase and multiply; and as the breach of this order is attended with punishment, game of every description increases prodigiously.' It is to be noted that this was not merely for the Khan's sport, but the game was an essential part of food supply for his immense establishment.

LEEDS NATURALISTS.

At the recent annual meeting of the Leeds Naturalists' Club and Scientific Association it was reported that there had been a steady flow of new members during the year and a good attendance at the meetings. Four lectures on general subjects had been given, and there had also been evenings devoted to lantern slides, microscopical work, botany, entomology, etc., each being organized by a member. The number of exhibits has been satisfactory, and an all-night excursion for the study of bird life was arranged and was successful. The Society's Annual Fungus Foray was held in Harewood Park, the Thorner Ponds were visited for the study of pond life; the Newthorpe Quarries for botanical purposes; and Harewood Bridge for freshwater biology. A visit was paid to the Museum at Leeds, and the Society gratefully acknowledges the gift of a new lantern by Mr. F. W. Branson. Miss M. Jaggar, M.Sc., was elected President, and gave an address on 'Animals in Winter,' illustrated by lantern slides. The Club opened its new session with a Conversazione, at which there were many interesting exhibits by different members as well as lantern slides.

SCARBOROUGH TREASURES.

We learn from the daily press that 'the excavations on the Castle Hill at Scarborough have revealed in the space of half an acre one of the richest antiquarian finds of recent years. The foundations have been bared and exposed a Mediæval church, Norman church, Saxon chapel, Roman signal station, and Prehistoric village; and careful sifting of the spot has yielded Roman pottery that is among the rarest ever discovered, skeletons, jewels, and other evidences

of 2500 years of history. The five years' task has been under the supervision of Mr. F. G. Simpson, director of archaeology at Durham University, and the Corporation financed the operations. The lowest strata showed relics of a prehistoric village, with more than 30 pits filled with broken pottery, bones of deer and boar, and domestic utensils. This village is believed to be of the Hallstatt period, and if this is so it will be the first village of this period to be unearthed in the north of England. More than 70 metal objects, including coins, bronze weapons and tools, jewellery and domestic articles are among the things that were used at this spot about the year 400 B.C. Relics of 16th century gale-brewing jars tell how Yorkshiremen used to brew their beer out of gale, a bush which grew on the moors of East Riding. Even the bung-holes of the jars are intact.' One wonders where these rare relics can be seen? Are they in Scarborough?

BRITISH ASSOCIATION AT LEEDS.

At the forthcoming meeting of the British Association at Leeds, Sir Arthur Keith, the new President, has taken as his subject 'Darwin's Theory of Man's Descent as it stands to-day.' Dr. R. N. Rudmose-Brown, Lecturer in Geography at Sheffield University, will inaugurate in the geographical section discussions on the problems of Polar geography; and in the Anthropological Section, Professor F. G. Parsons will talk on 'The Englishman of the Future.' Other presidential addresses will be as follows: Botany, Professor F. E. Fritsch, 'Some Aspects of Present-day Investigations of Protophyta'; Education, the Duchess of Atholl, 'The Broadening of the Outlook in Education'; Agriculture, Mr. C. G. T. Morison, 'Agriculture and National Education'; Geology, Dr. Herbert Thomas, 'Centres of Tertiary Volcanic Activity'; Chemistry, Dr. N. V. Sidgwick, 'Co-ordination Compounds'; and Zoology, Dr. G. P. Bidder, 'The Ancient History of Sponges and Animals.'

BRITISH MUSEUM JOURNAL.

The British Museum (Natural History) has followed the example of the museum at Bloomsbury in publishing a journal of its own, and No. 1 of *Natural History Magazine* was issued in January (32 pp., 1/-). It has a note of introduction by Sir Sidney F. Harmer, the Director; some note on the building by Dr. G. F. Herbert Smith; an account of 'Two Important Additions to the Collection of Beetles,' by G. J. Arrow; 'Tektites,' by Dr. G. T. Prior; 'Rafflesia: The Largest Known Flower,' by R. D'O. Good; 'Sirens in Fancy and in Fact,' by A. Tindell Hopwood; 'Remarkable Pair of Elephant Tusks,' by J. G. Dollman, who also describes 'The King's White Tiger'; Mr. B. H. Soulsby writes on 'Three

Rare Books in the Library'; Mr. N. B. Kinnear on the 'Red Oven-Bird: A New Species'; Mr. R. Kirkpatrick refers to the 'Heron-Allen Collection of Foraminifera'; and there is an obituary notice, with portrait, of the late William Fawcett. The journal contains advertisements.

JOURNAL OF ECOLOGY.

In *The Journal of Ecology* for February, the Editor, Prof. A. G. Tansley, has brought together a remarkable series of valuable monographs, some of particular value to northern naturalists. W. H. Pearsall and E. Marjory Wray write on 'The Physiology and Ecology of the Calcifuge Habit in *Eriophorum angustifolium*'; Kathleen E. Carpenter on 'Faunistic Ecology of some Cardiganshire Streams'; R. W. Butcher on 'The Vegetation of the River Itchen'; W. C. Allee and M. Torvik on 'Animal Distribution in the Panama Rain Forest'; Violet L. Anderson on 'The Water Economy of the Chalk Flora'; and J. W. Hopkinson on 'The Ecology of the Bunter Sandstone of Nottinghamshire,' with maps and figures.

THE B.-B. GULL.

The British Lesser Black-backed Gull was separated from the Scandinavian L. B.-b. Gull (the type), because our bird was not quite so black backed, on the basis of the Farne Island birds. The birds nesting on the Scilly Islands have much lighter backs than those nesting on the Farne Islands, and the latter were intermediate between the Scandinavian and the Scilly birds.* The scientific names given to the Scandinavian L. B.-b. Gull was *Larus fuscus fuscus* L., and to the British L. B.-b. Gull *Larus fuscus affinis* Reinhardt. It has now been discovered that the type is not a L. B.-b. Gull (*fuscus*) at all, but is a Herring Gull (*argentatus*).† Now where are we with all these B.-b. Gulls?

BLUE JOHN.

We learn from *The Quarry* for March that 'an important link with one of the oldest industries of Derbyshire has been severed at Matlock Bath by the death of Mr. Samuel Smith. He was one of the firm of Messrs. S. and W. Smith, of the Royal Museum, The Parade. They are almost the sole survivors of the ancient art of mosaic marble working, which at one time was a staple industry in Derbyshire. Kings and queens have visited these works, and it is reported that on one occasion Mr. Smith warned Queen Alexandra that a blue john mantelpiece would be rather expensive.'

* See *The Naturalist*, 1924, p. 19.

† See the recent supplementary number of *The Ibis* for March, 1927, pp. 197-8.

MUSEUM FOR SKIPTON.

We learn from the press that 'the suggestion by Mr. W. H. Dawson that steps should be taken to form at Skipton a museum to house the various finds in the Craven district has been approved by the Craven Naturalists' and Scientific Association. The Skipton Urban Council has agreed to set aside a room at the Science and Art Schools for the reception of exhibits until such time as a museum can be properly started. It is thought that the town is not sufficiently interested to be willing to contribute, through the rates, to the cost of a museum. Once the financial difficulty is overcome, relics of old Skipton in the hands of the local Council, and a much more diffuse exhibition in the Skipton Grammar School, would be merged as a nucleus of the museum.' We then learn that 'there is little likelihood of Mr. John Crowther's fine collection of British-Romano specimens at Grassington coming into the common stock.' Why?

UNDERGROUND.

The following is a sample of 'The Caves of Mendip,' by H. E. Balch*: 'To return to the Canyon. The descent was difficult, with much tackle for the difficult ways below. From point to point, from ledge to ledge, now at the bottom, now out again on to the sides, till at last the whole place as it were heels over and becomes a low broad shallow slide . . . Now crawling, now lying on our backs, now passing some "mummy" of ropes or ladders, we descended to a small continuation of the Canyon, with passages going off or coming in leading by imperfectly explored continuations to no-one-knows what. Now an S or Z bend occurred, with a pool of water in it, and prostrate and crawling we emerged on a sand-covered floor at the entrance to a lofty fissure or rift chamber. The approach is across a ten or twelve foot pit, difficult to cross, and at the end is a choked way which has not yet been touched.' For people who like this kind of thing we can thoroughly recommend the pamphlet.

CETACEA.

Prior to relinquishing his duties as Director of the Natural History Museum, South Kensington, Sir Sidney F. Harmer issued a substantial Report on Cetacea stranded on the British Coasts from 1913 to 1926,† in which he summarised the records of whales, dolphins, etc., gathered together since he made his reports. There are many maps showing the occurrences of various species, photographic and diagrammatic

* London : Folk Press, Ltd., 82 pp., 2/-.

† No. 10. 7/6.

illustrations, and a good index. Sir Sidney says that : ' With regard to general results, the inquiry has added a new species (True's Beaked Whale) to the British List ; it has shown that Cuvier's whale, so far from being an extreme rarity, is fairly common, and stands eighth in the list of frequencies. The White-beaked Dolphin, which has also been considered rare, is third in the list, where the British Cetacea are arranged in an order which few persons would have anticipated. The principal result, however, is the record of the seasonal and local occurrences of the several species, each of which has definite partialities as to time and place. Stranded specimens cannot, indeed, be expected to give full information on these subjects, but it is found that each year examined gives on the whole the same results as its predecessors, and the evidence thus obtained need not be ignored.'

COCKLES.

The Ministry of Agriculture and Fisheries has issued* ' A Report on the Cockle Beds and the Cockle Industry of England and Wales,' by F. S. Wright, in which an excellent review is given of the cockle industry in this country, with statistics as to the quantity and value of the cockles collected in the different areas during the years 1923-4-5. In Lancashire and Western Sea Fisheries District during 1925, 13,336 cwts. were collected at a value of £3546. An account of the life history of the cockle is given, from which we learn that : ' The fertilised egg develops into a tiny embryo which has a brief free-swimming phase. During this active period the larvae are distributed far and wide by the currents. Later, the shell grows, and the muscular foot is developed, and the young cockle, still less than 1 mm. ($\frac{1}{25}$ th inch) long, settles down in the sand for the remainder of its existence. For some time after seeking the bottom the young mollusc is able to creep about actively by means of its foot. The shell is now dark and pigmented, and difficult to distinguish amid its surroundings, while it also bears numerous short projections, or ' spines,' which doubtless serve to anchor it in the sand. These spines for the most part become worn away as the shell grows. At a later stage, the shell becomes an opaque white (about mid-July in South Wales and the Thames Estuary), at which time the length of the young cockle is between 3-4 mm. ($\frac{1}{8}$ th inch to $\frac{5}{32}$ th inch).'

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The Abbey House, Kirkstall, near Leeds, is to be converted into a Museum.

A prehistoric dug-out canoe, found recently in the River Tees near Stockton, has been placed in the Middlesbrough Museum.

* Fisheries Investigations, Series II., Vol. IX., No. 5, 45 pp., 3/- ne

SIXTY-FIVE YEARS OF YORKSHIRE GEOLOGY.

E. HAWKESWORTH.

(Continued from page 73).

CONCLUSION.

This somewhat scrappy sketch of the more important advances in Yorkshire geology cannot be concluded without making passing reference to other workers, who, even in perhaps a more limited sphere, have added to our knowledge:—J. W. Davis, who, in addition to his public services, was able to publish many papers, mostly on fossil fishes, and whose book on the Geology of West Yorkshire, published in 1878, was the first one to give any general account of the geology of that important part of our county; Thomas Hick, Jas. Spencer and Wm. Cash, who investigated the fossil plants of the Coal Measures, particularly those found in the Coal Balls of the Halifax Hard Bed; Wm. Simpson, who was ever ready to help in geological work of any kind; W. Lower Carter, who did yeoman service both as hon. secretary of the Yorkshire Geological Society, and in many departments of geological research; Rev. E. Maule Cole, ever ready to show the geology of the Wolds and north-east Yorkshire to those interested, and explain the archæology of those parts; Rev. John Hawell, who performed similar and equally willing service in Cleveland; Benjamin Holgate, who long years ago carefully measured the Coal Measures exposed in the Leeds area, and collected their fossils, besides writing upon the properties of the various coals found in the Measures. He was in great demand as a lecturer on geological matters, and one cannot refrain from mentioning, with tender respect to his memory, that his lectures first attracted me, when quite a lad, towards Geology. Then there was S. A. Adamson, with his wonderful descriptive powers, whose accounts of geological excursions and meetings did so much to popularise Geology. It was no uncommon thing, in his days, to be told, in the most inaccessible parts of the county, that his articles were read with great interest, and to see him welcomed as their author. Thomas Tate, C. D. Hardcastle and William Cheetham were also members of this group of Leeds men who did so much to interest others in our science thirty to forty years ago. All these, and many others, with some previously mentioned, have passed away, leaving records of useful accomplishment and pleasant memories. It is difficult to speak of the living, but one cannot refrain from naming the veteran, Wm. Horne, now 91 years old, who in his day was an enthusiastic student of geology of Wensleydale and Swaledale, and discovered many fossil fishes in the rocks

of those areas ; J. J. Burton, for a long life-time devoted to the geology of Cleveland ; J. W. Stather, with equal service in the East Riding ; Thos. Sheppard, who, apart from his original work in the same area, his services as past-secretary, past-president, and editor of the publications of this Union, and eminence as a bibliographer, has probably more papers to his credit than any other living geologist ; Alfred Harker, eminent in the petrology of the igneous rocks ; Godfrey Bingley, famous for his wonderful use of photography in illustrating geology ; all these, and many more, present and past members of our Union, have contributed their share towards the advancement of our knowledge of the geological features and history of our country.

In many other departments of our science, important work has been done during the past sixty-five years. For instance, the researches of Rastall and others on the older rocks of the Ingleton district ; the study of the underground waters of the Ingleborough and Penyghent area, undertaken and graphically described by the Yorkshire Geological Society ; the structure and origin of the Craven Reef-knolls ; the discoveries of animal and human remains in our limestone caves and fissures ; the Victoria Cave, near Settle, discovered accidentally in 1837, but not systematically explored until over thirty years later, when remains of four distinct occupations of it were found, a lower cave-earth, containing Pleistocene mammalia, clearly pre-glacial ; an upper cave-earth, with remains of existing mammalia, a layer containing Neolithic implements, and a Romano-Celtic layer, with remarkable relics of Roman civilization ; the Elbolton cave, explored in 1888, used partly as a dwelling, and partly as a burial place, in which human skeletons were found, also Neolithic implements and the bones of bears, reindeer, wild boar, wolf and Arctic fox ; and the Raygill fissure, with its bones of hyæna, elephant and rhinoceros, and a lion's tooth. Many remains of Pleistocene mammals have also been found in the gravels of Holderness, including the mammoth, red deer, Irish elk, reindeer, bison, rhinoceros, and at Burstwick bones of the walrus, the only record of this animal in Britain.

Much light has been thrown on the conditions under which our coal-seams were formed, and the nature of the plants forming the coal. Ancient river-courses in the coal-seams and their associated beds have been traced out, and many evidences of earthquakes during the deposition of our coal-seams have been described.

Our knowledge of the Jurassic flora has been added to by many important discoveries in the county, partly due to the efforts of a committee appointed by our Union, whilst another committee, with the invaluable assistance of the late

Dr. Kidston, was able to add to our knowledge of the Carboniferous flora.

The Geological Photographs Committee of the Union has accumulated a large collection of photographs, of great interest, and many of particular value from the fact that the sections illustrated are now non-existent.

Since the foundation of the Union, two societies, devoting their attention solely to Geology, have been formed, the Leeds Geological Association celebrated its jubilee two or three years ago, and the Hull Geological Association is of quite mature age. Both have done useful work, and are still quite active.

Many of the Field Clubs, and similar organisations affiliated with the Union, have also contributed their share to the knowledge of the geology of their particular districts.

The geological literature of the county needs no apology. Apart from the well illustrated *Proceedings of the Yorkshire Geological Society*, the numerous papers on geological topics in *The Naturalist*, the *Transactions* of the Leeds and Hull Geological Societies, and of our own Union, we have Davis and Lee's *West Yorkshire*, Baker's *North Yorkshire*, Sheppard's *East Yorkshire*, and most noteworthy, the monumental 'Geology of Yorkshire,' by Professor P. F. Kendall and Mr. H. E. Wroot, published quite recently—a book to be thoroughly recommended for its ample illustrations, and lucidity of description. *The Bibliography of Yorkshire Geology* has been and is still most painstakingly compiled by Mr. Thos. Sheppard. Besides his great work, published by the Yorkshire Geological Society in 1915, the records in which date from 1534 to 1914, and are fully indexed, and instalments published in our own *Transactions*, it is kept up to date in *The Naturalist*.

Notwithstanding this wonderful progress, there is still, and always will be, scope for future research and discovery, especially in a county like ours. Industrial developments will afford many opportunities for the geologist; it may be, indeed, that as new areas are opened out by mining, railway, quarrying, or engineering schemes, many things will be found which will necessitate the re-forming of some of our ideas, for there is no finality in Science, certainly not in Geology, for the surface exposed is infinitesimal as compared with the bulk.

There is still something to be learned about the pre-Carboniferous rocks of Upper Teesdale, and the Ingletonian rocks. The red conglomerates and their associated beds between the Silurian and Carboniferous still afford a problem for solution, which is given greater zest by the section described by Prof. Garwood, in Pinskey Gill, as being of 'unique character and uncertain age.'* New sections which may be made in the

* *Q.J.G.S.*, December, 1912.

Doncaster area should throw light upon the upper beds of the Coal Measures. Deep borings being made, or to be made, to prove coal in the eastern and south-east parts of the county, will furnish valuable information as to the underground geology of those areas. The relationship between the Permian and Trias is still obscure, and there are still a few gaps to be filled in the Glacial history of our county.

May this brief and ragged record of work done inspire us to greater effort in the acquisition of knowledge, not only of the Geology of Yorkshire, but of every branch of natural science in which this Union is interested, and for which our wonderful county provides so much scope. May the Union flourish exceedingly, and never lack men to carry on its great traditions, and if every one of its members derives as much real pleasure from his or her association with it as I have done during mine, its existence will be amply justified.

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From a report given to a recent meeting of the Linnean Society of London it would appear that there are now eighty-three different forms of British dandelions.

The Yorkshire Post (March 19th) informs us that 'three badgers have been captured near Doncaster, by Mr. F. C. Reynolds, of the Westminster Bank, Doncaster. Keepers having discovered a badger "earth," Mr. Reynolds went out with four little Border terriers, three of which had never been to ground before. The mother and one puppy entered, and though badly bitten held up the occupants, three fine badgers, which Mr. Reynolds and his assistants were able to bag. This is believed to be unexampled in a district like Doncaster. The largest badger weighed 30 lb., and all three were full sized. They are being kept alive, and Mr. Reynolds intends to put them down again where he is assured they will be preserved by the land owner.'

Sets E43 and 44, each containing five coloured cards illustrating exotic butterflies and a leaflet, have been issued by the British Museum (Natural History), South Kensington, at 1s. each. Set E43 illustrates five species or sub-species of *Agrias*, a genus of beautiful butterflies found in tropical South America. Set E44 contains reproductions of five butterflies of the genus *Heliconius* (found in Central and Tropical America), each of which is represented in the Museum by one specimen alone. These five specimens are all, so far as is known, unique. Direct colour photography has been used, and the insects photographed are all type specimens, i.e., the actual examples on which the authors based their descriptions when naming the species to which they belong.

We learn from a contemporary that 'the evidence of this oncoming of glacial cold is shown very clearly in the deposits filling the channel near Ipswich, because these are now sealed in by an accumulation composed of twisted and crumpled masses of sand, gravel, and clay (Bed No. 1, Fig. 3), which tells those who understand these things that for the third time East Anglia was over-ridden by an ice-sheet advancing from the cold and desolate north. This, then, is the graphic page of human history preserved to us in this filled-in channel in Eastern England, and those most familiar with the geological history of East Anglia have not much doubt that not less than 50,000 years separate us from the days when the Palaeolithic hunters made their camp by the side of the now silted-up and vanished Suffolk lake.' We are offering no prizes for guessing who wrote that!

A FORM VARIATION OF RANUNCULUS FICARIA.

M. A. JOHNSTONE.

(Continued from page 80).

(4) The water-content of the soil does not seem to encourage or to prevent the formation of the internode. A very dry habitat held both forms. The plants of the wettest situation examined had no internodes. Some of the plants in a sandy, but often-flooded, habitat had internodes or not, nearly indiscriminately. Pasture fields have both kinds. The mixed crowds growing within one square foot of ground or less are subject to no soil variation which could affect them.

(5) The depth at which the generating tuber or old stem is buried does not in all cases decide the form, though it cannot be said that it never does. The tubers mentioned in (3) above lay at the same carefully chosen levels in flower-pots, yet produced the two forms. In another experiment, carried out with both long and short tubers, specimens of each were placed at two levels in flower pots, one set being $1\frac{1}{2}$ in. below the other. Not a single internode was formed.

Internodal specimens were looked for amongst the plants of the alluvial habitat. A large proportion were of that type. From one cluster of old tubers, all the young plants given off had internodes, except one from a nearly spherical tuber. In another case, two out of four had internodes. Some parent plants which had surface-seated tubers produced young plants without internodes. Even in some of these, however, an internode seemed to furnish a means of getting free from clustered tubers. It might be inferred fairly from the conditions of this bed that the lengthening of the internode depended on the depth at which growth started. Young plants in a very dry habitat, originating at the same levels, were noticed to possess either form indifferently. No instance could be found in which the deciding factor could be said to be unquestionably one of depth.

(6) There remains one external condition which may be effective, and which for some time I thought was the most likely. It is the impediments encountered by a sprouting tuber which is embedded amongst many attached tubers, as in the clumps which have several times been spoken of. Such an individual would not easily get a first leaf through the well-packed mass, but a fine thread-like internode might insert itself amongst them carrying its apical bud forward to the free space above in which its leaves might unfold. The converse might be even more probable, namely, that the formation of the internode is the rule unless it is checked by

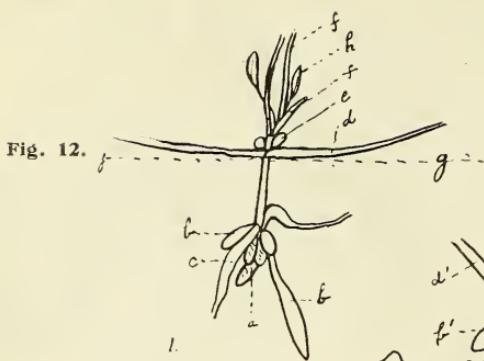


Fig. 12.

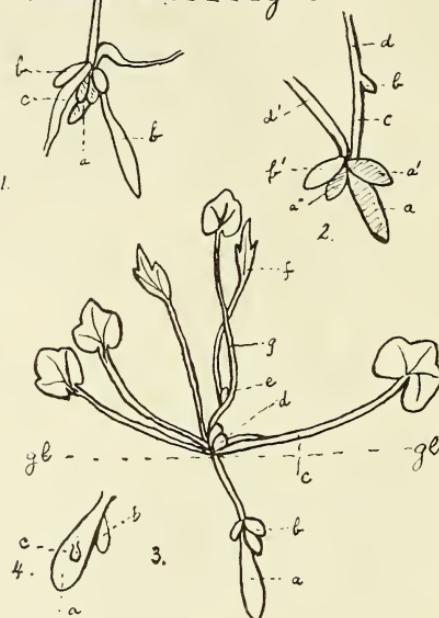


Fig. 13.

Fig. 14.

Fig. 15.

Fig. 12.—Sterile plant: reduction caused by transplanting from wet to dry situation. (May.)

- (a) Old ground tubers; (b) Long first ground tuber and short ground tuber; (c) Pair of leaves from new tuber node, turned back; (d) Pair of leaves at first aerial node; (e) Aerial tubers in axil of (d); (f) Leaf pair rising from top of very short internode, seen between (e); (h) Two slender leaves from axils of (f); (k) Petiole of similar leaf from axil of (d); (g.....g) Ground level.

Fig. 13.—Two young plants from tubers still in connection. (May, 1914.)

- (a) Longest of older tuberous roots; (a') and (a'') Short, probably same age as (a) (all in connection); (b) Tuber of 1914, on internodal plant sprung from (a); (c) Internode of that plant; (d) Petiole of first leaf of that plant; (b') Tuber of 1914, on non-internodal plant from tuber (a''); (d') Petiole of leaf of that plant.

Fig. 14.—Two tubers, (b) and (c) from tuber (a).

Fig. 15.—Two-year old plant grown from aerial tuber. (Experiment: June.)

- (a) Long new tuber (old tubers gone); (b) Short new tuber; (c) Pair of leaves at first aerial node; (d) Aerial tubers in axils of (c); (e) Aerial tubers at higher node; (f) Slender leaf associated with tubers at (a); (g) Leaf with tubers at lowest node; (gl.) Ground level.

obstacles such as the tubers amongst which it lies. Here and there I have found what seemed like support for this view, but it would not explain the case of two tubers sprouting in a flower-pot, in precisely similar conditions of freedom, yet one showing an internode, the other none.

(7) Heredity must be ruled out. There is too much proof, as seen above, that both forms may spring from the same parent. An additional instance may be given. Internodes

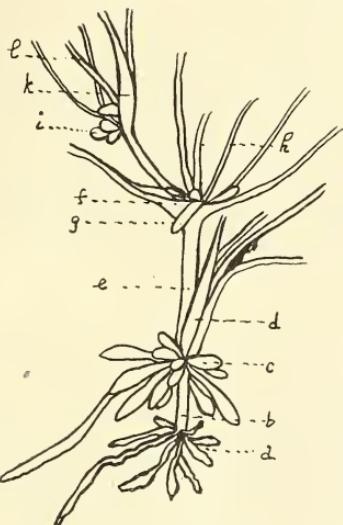


Fig. 16.

Fig. 16.—Adult sterile plant with internode. (May.)

(a) Old ground tubers; (b) Ground internode; (c) New ground tubers; (d) Group of leaves from ground node; (e) First aerial internode; (f) Bases of first pair of leaves; (g) Aerial tubers in axils of (f); (i) Aerial tubers which have broken through at second node; (k) Base of leaf at second node; (l) Petioles of fine leaves associated with (i).

were found in all the sprouted tubers which made up a small group surrounding a parent, at an average depth of half an inch; the parent plant exhibited no internode.

What is perfectly certain is that there *always is an internode*. All that requires to be explained is its remarkable abbreviation in certain instances. (The expression 'internode absent,' as used above, is to be taken as meaning 'apparently absent.') I have not found a single instance amongst many hundreds in which the two sets of tubers were not distinctly separated. The internode may be shortened down to its utmost limits, but essentially it exists. This is quite clear when sections are made. At the lower level there is a thickened node from which the older tubers emerge, having its

special anastomosing vascular bundles ; at the higher level there is a stouter, broader node bearing the new set of tubers, and having vascular arrangements similar to the first ; there is always a region which connects these two—that is, an internode. This region may be long or excessively short ; it is regularly cylindrical and of smaller diameter than the nodes ; its vascular tissues are disposed as a ring of separate bundles regularly arranged.

It is possible that the actual length of internode attained may be due sometimes to one external factor, sometimes to another, which encourages or impedes growth as the case may be. Possibly, the plant's individuality may provide an internal stimulus. One hypothesis accounts for the ground tubers as being, historically, buried aerial tubers, and the subterranean internode would therefore stand for an aerial internode in remote history. Its invariable occurrence as well as its variable length in its unnatural position would be quite consistent with the theory.

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The Editor of *The Museums Journal*, Mr. C. C. A. Monro, has recently been married.

'H. J. T.' writes an appreciation of the late George T. Porritt in *The Entomologists' Record* for March.

Sir E. Kay Lankester writes on 'The Future of the Natural History Museum, South Kensington,' in *Nature* for February 26th.

Hobbies, the magazine published by the Buffalo Society of Natural Sciences, for March, is devoted to a well-illustrated account of 'Crabs of the Seashore.'

Koremagrapthus is a name given to a new Dendroid Graptolite (*Ann. and Mag. Natural History* for March), the name being chosen because the specimen resembles a brush.

The Colliery Guardian for March 18th contains a map showing the contours of the Barnsley Bed in the South Yorkshire Coalfield, and a map showing the thickness of the proved coal in the same area.

The Journal of the Ministry of Agriculture for March contains notes on 'The Downy Mildew of the Hop in 1926,' by Prof. E. S. Salmon and W. M. Ware ; and 'The Control of *Aphis* on Black Currants,' by G. E. Hudson ; among other interesting items.

An illustration of the 'largest crab' (Giant Japanese Crab) appears in *The Australian Museum Magazine* for January-March. Judging by the figure standing at the side, there is a still larger one of the same species, and in perfect condition, in the Museum of Fisheries at Hull.

Referring to the notice of Mr. C. B. Travis's paper in *The Naturalist* for February, page 34-5, it should be pointed out that the extraordinary number of species of plants recorded in the South-west Lancashire Peat is the result of the identification of the plants by Mrs. E. M. Reid and Mr. W. G. Travis, and the pollen grains and timber by Mr. C. B. Travis.

The March issue of *The New Phytologist* includes 'Studies in the Ecological Evolution of the Angiosperms' (in which Yorkshire specimens are referred to) ; 'Mycorrhiza,' by M. C. Rayner ; 'Seedling Development of *Festuca rubra* L. var. *tenuifolia*, etc.,' by W. O. Howarth ; and 'Interglacial Occurrence of *Aldrovanda vesiculosa* L.,' by P. A. Nikitin.

CUMBERLAND COLEOPTERA AND HEMIPTERA IN 1926.

F. H. DAY, F.E.S.

ON the whole the past season was not a good one for these insects in this county so far as my observations went, in fact, it is some years since I experienced a really good entomological season. However, I have to chronicle the addition of six species to the Cumberland list of Coleoptera, which brings it up to the respectable total of 1816 species. These 'new' species are:—

1. *Myrmedonia limbatus* Pk. Ennerdale, 5th June, 1926, two specimens under stones by the side of the lake in association with the yellow ant (*F. flava*). This species has been recorded from Northumberland on the banks of the Irthing, which river is the boundary between that county and Cumberland.

2. *Lesteva luctuosa* Fauv. I have five examples of this recent addition to the British list, four from Helvellyn, 14th August, 1910, and one from Skiddaw, 21st May, 1911. These, with the kind assistance of Mr. M. L. Thompson, who lent me authenticated types, I have only lately determined. The species is evidently an alpine one. Mr. Thompson has already recorded it from Dufton Fell, Westmorland (*Naturalist*, 1926, p. 216).

3. *Phyllodrepa puberula* Bernh. Another recent addition to the British list. I recorded two examples from Cumberland in *E.M.M.*, 1926, p. 49. On June 29th last I captured a third by beating the flowers of guelder rose at Southwaite.

4. *Stenus ater* Man. One example in reed refuse at Tarn Wadling, 3rd May, 1926. I do not think this species has been recorded from so far north before.

5. *Psilothrix cyaneus* Ol. (*nobilis* Brit. Cat.). I have seen a specimen of this taken by Mr. Murray at Seascale in July, 1921. An unexpected addition to the Cumberland list. Except for Bold's doubtful Northumberland record I can find no reference to its occurrence in any of the northern counties.

6. *Aphthona nigriceps* Redt. I am also indebted to Mr. Murray for this record. In September, 1925, he beat a number of specimens from *Geranium* at Dundraw. It is a widely distributed species in Britain, but very local, there being extensive areas from whence it has not been recorded.

Early in April I spent an afternoon on Bowscale Moss with the water net, and found both beetles and bugs plentiful. The most interesting beetle was *Rhantus bistriatus* Berg., a

decidedly scarce insect in Cumberland. *Acilius sulcatus* L. almost as dark as var. *scoticus* Curt. was common. Among the bugs the best were *Corixa venusta* D. and S. and *moesta* Fieb., both abundant. The only *Gerris* present was *gibbifer* Schum. In May, at Tarn Wadling, by sifting heaps of dead reeds and rushes I found several interesting beetles as well as the *Stenus* already referred to. *Calodera aethiops* Gr. and *Philonthus micans* Gr. were abundant, *Lathrobium quadratum* Pk. less so. I was glad to take four specimens of *Atheta cadaverina* Bris., which has occurred in Cumberland only once before. At Garrigill in the Pennines *Quedius auricomus* Kies. and *Stenus guynemeri* Duv. occurred in waterfall moss, and in a little stream a few *Hydroporus borealis* Gyll. were met with. The *Quedius* occurred again at Brandy Gill in the Caldbeck district, but unaccompanied by the *Stenus*, its place being taken by *Dianous cerulescens* Gyll. in great numbers. In the Nature Reserve at Kingmoor I took three species new to that productive locality, viz., *Atheta angustula* Gyll., *Stenus bifoveolatus* Gyll., and *Prasocuris junci* Brahm.

On Whit Monday I had a long tour round the northern part of the county, stopping first on the banks of the R. Liddell at Penton, where, among shingle, I found *Bembidion prasinum* Duft., *nitidulum* Marsh., *decorum* Pz., with other commoner members of the genus, *Helophorus arvernicus* Muls., *Atheta cambrica* Woll., *Stenus incanus* Er., *Geodromicus nigrita* Mull. and *Hydroporus septentrionalis* Gyll., the last named in the river. Hopping and flying among the shingle were great numbers of the extremely delicate little bug *Cryptostemma alienum* H.S. Its activity made its capture somewhat difficult but by patience I secured a good series. The day was warm and sunny; on dull days I have found it in other localities under stones in a sluggish state. When alive the 'bloom' of the fine pubescence is very evident. A few miles further on a halt was made on the Cumberland side of the Kershope burn where I found *Callicerus rigidicornis* Er., a scarce insect in this district, *Staphylinus erythropterus* L. and *Quedius umbrinus* Er. The only common insects hereabouts were *Corymbites cupreus* F. and var. *aeruginosus* F., which were flying about on the rough hillsides. Turning south-east, a short time was spent by the small river Kingwater, where I found *Bembidion atroviolaceum* Duf., *schuppeli* Dj., *Bledius pallipes* Gr. and *Aegialia sabuleti* Pk., and the outing was concluded by taking *Bembidion monticola* Stm. freely on the margins of the River Irthing.

One evening at the beginning of the summer I paid a visit to the haunt of *Hydrothassa hannoverana* F. in the Eden Valley, and found it as common as ever on its food plant, *Caltha palustris*. This appears to be the only known British locality

nowadays for this pretty beetle. At St. Bees Head *Sitona lineellus* Gyll. occurred at the roots of *Lotus corniculatus* with odd examples of *Dromius nigriventris* Th. and *Subcoccinella 24-punctata* L. After several years of fruitless search for *Dyschirius angustatus* Ahr. on the Solway Marshes, I was glad to find it again last June in the old locality at Kirkbride, but very sparingly. On the same ground I took *Erirhinus bimaculatus* F. and the bug *Conostethus salinus* Sahlb. At Middlesbrough, among numerous captures were *Agathidium rotundatum* Gyll., *Antherophagus pallens* Ol., *Agriotes acuminatus* Steph., *Batophila rubi* Pk., and *Ceuthorrhynchus cochleariae* Gyll, with the bug *Lygus cervinus* H.S.

In the middle of July I had a fortnight's holiday at Seascale, but with one or two exceptions insects were extremely scarce. *Sitona lineellus* Gyll. on *Lotus corniculatus* and *Apion confluens* Kirb. on *Matricaria* occurred rather freely, and *Coccinella 11 punctata* L. was abundant in the sandhills, the form known as *confluens* Donis being frequent, and I got one ab. *boreo-littoralis* Donis. Other beetles captured included *Bembidion bruxellense* Wesm., *Amara lucida* Duft., *Falagria thoracica* Curt., *Stenus niveus* Fauv., *Meligethes* var. *aestimabilis* Reitt., *Cryptophagus cellaris* Scop., *Donacia discolor* Pz., *Apion gyllenhali* Kirb., *Phytonomus fasciculatus* Hbst., and *trilineatus* Marsh. Among the Hemiptera captured were *Myrmus miriformis* Fall., *Nabis major* Cost., *Calocoris lineolatus* Goeze., and *Megaloceræa psammæcolor* Reut., the last-named being very abundant in the sandhills among the marram grass. The entomological feature of the district during my visit in July was the abundance of the larvae of the Cinnabar moth (*E. jacobææ*), especially in the gullery at Ravenglass, where the ragwort plants were eaten bare of leaves, and the hungry larvae were to be seen ranging over the ground in thousands searching for a fresh supply of food.

On August Bank Holiday I collected in the Eden Valley in the Armathwaite district. The only beetles of note were *Amara acuminata* Pk., four fine examples in a quarry, *Triphylloides suturalis* F. in fungi, and *Longitarsus succineus* Foud. by sweeping. Hemiptera were rather more abundant, and among other species I met with *Stygnochoris pedestris* Fall. running on the ground among low plants, *Phytocoris tiliae* F., common on lime, *Lygus viridis* Fall., also on lime, but rather scarce, *Camptozygum pinastri* Fall. on Scots pine, *Psallus falleni* Reut., and *Campyloneura virgula* H.S. on oak.

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The British Museum (Natural History) has issued four further series (Nos. 10-13) of postcards dealing with Exotic Moths. Each packet contains five cards in colour with a four-page description of the species illustrated, and is sold at one shilling.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

'A Chat about Holderness and the East Riding,' by Dr. Thomas C. Jackson, dealing with many interesting topics, occurs in *The Transactions of the Yorkshire Dialect Society*, recently issued.

'Fire as an Agent in Human Culture,' by Walter Hough, Head Curator of Anthropology in the United States National Museum, appears as *Bulletin 139 of the Smithsonian Institution*. It contains nearly 300 pages and many illustrations.

'A Preliminary Biological Survey of the Lloyd-Cornell Reservation,' by Members of the Scientific Staff of Cornell University, has been issued as *Bulletin of the Lloyd Library of Botany, Pharmacy and Materia Medica*, No. 27. It contains 247 pages of letterpress and numerous plates.

The Durham University Journal for March has the following valuable papers, the first being illustrated by blocks from photographs of different species of moths: 'On the Inheritance of Acquired Characters,' by F. C. Garrett; 'Evolution and Man,' by B. Millard Griffiths; and 'Excavations at Knaresborough Castle,' by S. Barber.

The Marlborough College Natural History Society has changed its printers after sixty-one years with one firm, and its *Report* is now printed at the Cambridge University Press, due to differences in the prices of printing. In the report, No. 75, just to hand, are valuable contributions to the various sections of the Society's activities by the recorders and others; the usual meteorological reports, and additions to the local list of birds. Mr. J. G. D. Clark has an illustrated note on Saracen implements.

The Transactions and Proceedings of the Perthshire Society of Natural Science (Vol. VIII., Part 3), contain two or three items of special interest, particularly Mr. William Thompson's paper on 'The Hill Trenches of Perthshire'; G. Bates' Presidential Address on 'Reproductive Processes in Algae'; 'Notes on Some Birds of Perthshire and the Faunal Area of "Tay,"' by Lord Scone; and 'Prehistoric Stone and Bronze Implements recently obtained for the Perth Museum,' by J. G. Callander.

Among the valuable monographs appearing in *The Proceedings of the University of Durham Philosophical Society*, just issued, are the following: 'The Crystallisation of Metals,' by C. H. Desch; 'Geological and Petrological Studies of the Calton Hill (Derbyshire) Volcanics,' by S. Tomkeieff; 'The Geological Relations of the Coast Sections between Tynemouth and Seaton Sluice,' by R. G. Absalom and W. Hopkins; and 'Plant Decay and Subsequent Mineralisation,' by M. Thomas, S. H. Collins, and H. G. A. Hickling.

The *Manx Society* is issuing a valuable work on 'The Place Names of the Isle of Man, with their Origin and History,' by J. J. Kneen, in six parts, one of which (Part III.), dealing with Sheading of Garff, is before us. The author seems thoroughly to have gone into the variety of names and their meanings. The following is a sample of his method: 'Hillberry, hilberi, 1754, Dioc. Reg., Knock berrey; 1760, Dioc. Reg., Knock y bury; 1870, Ord. Sur. Map, Cronkybury. Scand., berg, "a hill"; Gael., knock, modernized into crone, also meaning a "hill," and now translated so. In 1703 the holder is set down as "John Kewley of the Hill."'. The book is well printed on good paper.

Miss J. B. Procter has a coloured plate of an albino grass snake in *The Proceedings of the Zoological Society of London* for December, just issued. No locality is given, but we understand it was taken near Sevenoaks in Kent. Other interesting papers in this publication deal with 'The Annual Increment of the Antlers of the Red Deer (*Cervus elephas*),' by J. S. Huxley; 'The recent Birth of a Hippopotamus (*H. amphibius*) in the Gardens,' by G. M. Vevers; 'The Land and Freshwater Mollusca of the Scilly Isles and West Cornwall,' by O. W. Richards and G. C. Robson; and 'Observations on the Mating Habits of some Web-spinning Spiders,' by G. H. Locket, with notes by W. S. Bristowe.

**THE YORKSHIRE NATURALISTS' UNION'S
SIXTY-FIFTH ANNUAL REPORT
FOR 1926.**

(Continued from page 94).

Soppitt Library Report.—The following publications have been received during the year and added to the Library: *Transactions and Annual Reports*, for the years 1924-25 and 1925-26, of the North Staffordshire Field Club. In addition to the Reports of the sections, these parts contain an Appendix on the 'North Staffordshire Flora,' by W. T. Boydon Ridge, Parts IV. and V., and the Report for 1924-25 contains a study of the ecology of 'The Distribution of *Pisidia* in the Oakamoor District of the Churnet Valley.' 'Light and Growth,' by Prof. J. H. Priestley, Y.N.U. Presidential Address, 1925; and Archivos do Jardim Botanico do Rio de Janeiro, Volume IV., 1925.

The Naturalist.—During the year *The Naturalist* has been the medium of preserving the valuable records made by the various sections and committees of the Yorkshire Naturalists' Union at their meetings and excursions; in addition to which actual papers read have been appearing in *extenso*. Particular mention may be made of the valuable Presidential Address of Professor Priestley on 'Light Upon Growth,' and the series of papers on Yorkshire Ammonites by Dr. F. L. Spath, of the British Museum, and the contribution to Diptera by the late George Grace. The volume has been remarkable from the large number of contributions by well-known naturalists and scientific men, as well as, unfortunately, for the great number of Obituary Notices relating to prominent northern workers. As previously, the Union is indebted to different friends for the expense incurred in connection with blocks. An effort is being made to restore the Journal to its pre-war status as regards quality of paper, etc., but unfortunately, not only the extra cost of paper and printing, but the serious additional charge of postages at present interferes with the improvements desired.

ENTOMOLOGICAL SECTION.

G. T. Porritt :—I believe the season has been the best we have had for some years, especially the earlier part of it. In July I was very pleased to come across *Conchyliis smethmanniana* commonly on the Waterloo Tip, Huddersfield, as the species was quite new to the Huddersfield district, though there are other recorded Yorkshire localities for it. It was flying at dusk among one of its food-plants, *Centaurea nigra*. Another Tortrix, *Penthina dimidiata*, which was formerly common in a hedge very near to my house, turned up again quite as freely in another hedge at no great distance from the old locality, which had been completely destroyed through building operations. The species which has interested me most, however, is *Hadena pisi*. Its larvae were plentiful on Royd Edge Moor in 1925, feeding on bilberry, and from half a score of them which I brought away, picked up on widely separated parts of the moor, I bred four moths only, all of an almost uniformly dark purplish brown colour, with the exception of the usual yellow subterminal band. I had never seen any like them, although a very worn specimen I took at Rannoch many years ago, may have been of the form when fresh. They are much darker than the variety *scotica*, and altogether different from the type form. Apparently they represent, probably, the only form on that moor, but whether it is now the Huddersfield form generally I do not know. I have been unable to find any published description of it. Another common moth in which melanism has become strongly pronounced on the Waterloo Tip is *Crambus hortuellus*. In June the moth was

swarming there as usual, and in perfect condition, and all the males apparently were more or less melanic: whether the females were so I do not know, as I found on setting them that towards the thirty I boxed were all males. Possibly the females were not yet out. In the same locality I netted a specimen of the golden brown form of *Acidalia aversata*, the only one I have seen in West Yorkshire, although it is not uncommon in the eastern division. The moth deposited about fifty eggs, and of the larvae from them, five fed and spun up as second brood, three of which produced the brown form of the female parent, and one the ordinary grey form: the fifth pupa was deformed and the moth did not emerge. *Orgyia antiqua*, which it will be remembered occurred in thousands on Royd Edge Moor last year, was quite scarce again as it usually is, although millions of eggs must have been on the moor the previous autumn. This is one of the entomological mysteries which are so baffling. *Ourapteryx sambucata* was more abundant than I have ever previously seen it in the Huddersfield district, and the larva occurred on gooseberry (quite a new food-plant) in my own garden. *Emmelesia decolorata* was common among *Lychnis vespertina* on the Waterloo Tip, a species I had not seen here for many years, although formerly abundant enough. Larvae of *Eupithecia pulchellata* occurred on the foxgloves in my garden.

Mr. Ash found a number of larvae of *Nonagria arundineta* in his district, and bred a fine series including var. *dissoluta* and the rosy and drab forms.

Coleoptera (M. L. Thompson):—*Atheta oblonga* Er., *Bolitochara mulsanti* Shp., and *Phyllopertha puberula* Berhn, are three additions to the Yorkshire list, taken respectively at Middlesbrough, Kildale and Saltburn, the last two having only recently been satisfactorily determined though captured some years ago. The abundance at Barnsley of *Tetratoma fungorum* F. this season may also be noted. Members of the Coleoptera Committee attended the excursions of the Union for 1926 at Allerthorpe Common, Castle Howard, and Middleham. *Mycetophagus atomarius* F. was taken at Middleham, and the very local *Orchesia minor* Walk. at Castle Howard.

Lepidoptera (B. Morley):—Butterflies generally have not been abundant, but the Rev. C. D. Ash, of Saxton, writes me that *Euchlöe cardamines* and *Vanessa urticæ* were both plentiful in his district. Only odd examples of *V. urticæ*, *V. io*, *V. atalanta*, and *V. cardui* were seen in the Skelmanthorpe district. The three species of common 'whites' have been rather numerous, each species appearing a second time, but the second brood of *P. brassicæ* was late, being probably at its best in mid-September.

Mr. W. Buckley found a very nice black *Acronycta menyanthidis* on Spicer Common, near Penistone, at the end of May. Mr. J. Boothroyd caught an example of *Zygæna lonicerae* in Penistone Road, Huddersfield, in July, and a specimen of *Z. filipendulae* was found in Deffer Wood in the same month. It is impossible to explain the occasional occurrences of these species in South-west Yorkshire, as no colony of either species is known to exist in the area.

A very strong colony of *Cænonympha pamphilus* was discovered on Spicer Common, near Penistone, in June. The locality is about 1000 feet high, and no variation appears to exist between the specimens taken at this altitude and others taken on the high moors above Langsett, and others again which occur in the lowlands.

Both *Saturnia pavonia* and *Bombyx* var. *calluna* were very plentiful, and a few larvae of the black race of *Agrotis agathina* were also found on the moors near Penistone.

I have always regarded *Hadena glauca* a moor species only, but on May 23rd Mr. Clarence Morley found two fresh specimens in Deffer Wood on a heathery patch which was cleared of trees a few years ago.

In July, at Skelmanthorpe, *Ourapteryx sambucata* was exceptionally plentiful, and a few specimens of *Xylophasia scolopacina* were taken.

In August, at the same place, *X. monoglypha* was abundant as usual on the sugar patches, but many of the specimens were quite black, and along with them a few *Noctua dahlii* occurred.

In June Mr. Clarence Morley bred a number of *Hadena dentina* from a female obtained locally last year. They are an interesting lot, decidedly darker than usual, and indicate still another species with a tendency to melanism.

Neuroptera and Trichoptera (G. T. Porritt) :—Mr. F. Snowdon sent me a fine deeply coloured male *Calopteryx virgo* from Whitby, as something he had not previously seen there; it is a new record for the locality. Mr. W. D. Hincks reports *Æschna juncea* from Potternewton, Leeds, by Mr. Caird; *Æschna cyanea* bred by Mr. Whitehead from nymphs taken at Bramhope; *Pyrrhosoma nymphula* as first seen on May 24th, and several bred in June from nymphs taken in April at Blackmoor. *Perla cephalotes* and *Panorpa communis* occurred at Thorne on June 4th. Of the Psocidae, *Psocus variegatus* occurred at Adel Moor, and *P. nebulosus* and *Stenopsocus immaculatus* were common at Harewood. The Psocidae are but little known in Yorkshire, and a diligent worker among them is very much needed.

The most interesting item in these orders is a further record by Mr. Harold Hodge, of London (in *The Entomologist* for October), of *Anax imperator* at Burley-in-Wharfedale, as there has always been a doubt as to the Yorkshire status of the insect. Many years ago Mr. J. Beanland told me he was almost certain he had seen a number of specimens at Burley, and in 1917 Mr. Hodge also recorded it from the same locality. Although none of the specimens seems to have been actually captured, this accumulated evidence would ordinarily have been enough to include the species in our Yorkshire list, as it is sufficiently distinct from any other dragonfly to be distinguished even on the wing by anyone familiar with it. But, unfortunately, all these recorded examples seem to have been in August and September, whereas *A. imperator* is essentially a June and July species. It is the largest of the British dragonflies, but is nearly equalled in that respect by three species of *Æschna* which are on the wing in August and September, so there is still the suspicion that the supposed *A. imperator* may have been one of them. I would suggest that in the coming year an effort be made to clear up this point.

Hymenoptera (Rosse Butterfield) :—Four specimens of *Sirex gigas* have been caught near Keighley by separate persons. Perhaps it is relatively one of the rarest of the Hymenoptera, but on account of its striking appearance it is more often reported than any other.

Mr. W. D. Hincks has forwarded a list of eight saw-flies, chiefly from near Leeds. *Platycampus lindiventris* and *Dolerus palustris* are interesting. The former is new to the county, and I have one of the latter from near Keighley, which, to use the late Mr. Morice's words, 'if it is not this, I do not know it.' It differs from the type. *Rhadinocera micans*, obtained from Askham Bog, Yorks., some years ago by Mr. Porritt, is a new record which should be mentioned. There are about fifty saw-flies from Keighley district this season, chiefly collected by Mr. J. Wood, yet to determine, and also a number of Chalcids and Cynipidae.

Mr. Lyle is making investigations in Yorkshire; last year he sent a list of thirty-five species. He has been good enough to examine those obtained near Keighley this year.

Mr. E. G. Bayford has bred from larvae of the buff-tip moth, *Cygena bucephala*, *Apanteles fulvipes* Hal. This host is not among those included by the Rev. T. A. Marshall in his list. Mr. Lyle is making investigations in Yorkshire; last year he sent a list of thirty-five species. He has been good enough to examine those obtained near Keighley this year.

Arachnida Committee (Mr. Falconer) :—The only Arachnids received during the year for identification were contained in a small

gathering from one particular part of Hornsea Mere, made by Mr. T. Stainforth during the Union meeting there in May. Included were representatives of 26 kinds of spiders, 1 harvestman and 5 mites, and of the first-named three were new to the locality, viz., *Diplocephalus picinus* Bl., *Microneta viaria* Bl., and *Lycosa palustris* Linn. The harvestman was *Platybunus triangularis* Herbst., a name which, by priority takes precedence of *P. corniger* Herm. None of the mites was unusual, but in one case the specimen had not previously been recorded from this place, and, having in view two papers, published in *The Naturalist*,* a note concerning it becomes necessary. The true *Macrocheles marginatus* (Herm.-Oud.) is not British, and for the examples hitherto known by the name in this country, the Rev. J. E. Hull has created a new sub-genus, and given a new specific name, *Monoplites oude mansii*.†

Ichneumonidae.—No records or observations of this extensive family have been forwarded. Mr. Wood has collected and set a few hundreds from near Keighley.

Proctotrypidæ.—These interesting parasitic creatures are now included with the Aculeata. Mr. Wood and I have obtained a few this season.

Aculeata.—Mr. E. G. Bayford reports that *Psen dahlbomi* Wesnr., has been bred from damaged timber taken from the roof of Wakefield Cathedral—an interesting addition. Mr. Wood took at Shipley Glen in July two ♂♂ of *Crabro tibialis*. The male of this has distinct character, and the five species should be included in the list. Females were obtained some years ago.

Mr. A. E. Bradley reports a colony of *Andrena trasata* near Leeds.

One of the features of the season was the large number of nests of *Crabro dimidiatus* between the chinks of masonry of Gronington Bridge. Saunders says the species nests in stumps.

Diptera (Chris. A. Cheetham):—It was only by many efforts that half a dozen specimens of the early cranefly, *Tipula paludosa* were obtained, and other species were also scarce; later on, in autumn, *Tipula oleracea* came in fair numbers, and also some of the marsh species like *Tipula melanoceras*.

What applies to *Tipula* is also the case with other groups, for instance, in autumn some vast swarms of Chironomids were seen, and occasionally Syrphids were plentiful then.

Mr. Fordham has added many species to the Yorkshire list, mostly by persistent collecting at Allerthorpe Common.

Mr. F. W. Edwards spent a few days in the East Riding in July, and his captures include a considerable number of additions; it is hoped that an account of this trip will be published.

We are indebted to Mr. Percy H. Grimshaw for another gift of numerous specimens for the type collection he previously presented to the Union. The pages of *The Naturalist* have not lacked diptera matter, and the late Geo. Grace helped to clear the way for the student with his paper on 'The description of Nematocerous Flies, especially Chironomidae.' The many terms employed in descriptions of diptera are here explained, and the diagrams should enable students to understand modern descriptions; unfortunately, older writers had a way of inventing their own terms; the confusion, say of the systems of naming the wing veins, is shown in the table on page 215, and there are others not shown in this list.

The sudden death of Mr. Grace has left a grievous gap amongst dipterists. He was engaged on a paper on Chironomidae in conjunction

* 'The Mites of Yorkshire,' August, 1923, and 'Two British Mites New to Science,' April, 1923.

† *Annals and Magazine of Natural History*, Ninth Series, Vol. XV., February, 1925.

with Mr. Edwards, the latter being at present in South America on a collecting trip, Mr. Grace had arranged to see the paper through the press for the Entomological Society of London's Transactions. Mr. Grace's work in connection with this was very valuable, and among other things he made an immense number of measurements of the relative lengths of the antennal and leg parts, work which needed great concentration and time. Work on the Chironomids has again been materially helped by the careful and extensive collections made by Mr. J. Wood, of Keighley, to whom Mr. Grace made acknowledgment last year.

Mr. John R. Dibb has been studying the Yorkshire forms of the genus *Tanypus* in its wide sense, and has been able to recognize so far twenty-one of the forty-five British species, and he has several others at present under examination which will serve to swell the list. Mr. Dibb hopes early in 1927 to publish a paper on the Yorkshire species of this group.

Mr. W. D. Hincks has been investigating a large collection of the group Chironomus made by Messrs. R. Butterfield and J. Wood in the Keighley district. He has been able to recognize about 50 species of the group in the county, and is at present preparing a paper on them, which he hopes soon to publish.

Mollusca (Greevv Fysher):—In a small pond near the road from Gristhorpe to Muston, near Filey, *Ancylus lacustris* was found to be very abundant in September. Few of other species were observed.

The pond in King Lane, Leeds, which has for many years yielded occasional specimens of the sinistral variety of *Limnaea peregra* has undergone great change in consequence of the development of the field as a building estate. It is now a circular form and guarded by an iron palisade. It is hoped that the species has not been exterminated, and that the rare form may be observed in the spring and in future.

Exceptional forms of *Anadonta cygnea* were seen in Crimple Beck between Wetherby and Knaresborough.

STATEMENT OF INCOME AND EXPENDITURE.

12 months to November 22, 1926.

INCOME.		EXPENDITURE.	
	£ s. d.	£ s. d.	£ s. d.
Members' Annual Subscriptions, arrears	11 14 0	Expenses of Meetings	7 6 0
" 1926	104 1 0	Postages, etc. (including addressing, etc., of circulars), (Hon. Secs' A/c)	13 8 1
" 1927	3 4 6	Printing and Stationery (General A/c) (Hon. Treasurer's A/c)	35 8 3 2 5 3
	118 19 6	Postages, etc.	1 10 11
Levies from Associated Societies, arrears	1 2 8	Cost of Wreaths	2 10 0
" 1926	12 3 11	Donation to University of Leeds Appeal Fund.,	10 10 0
	13 6 7		£ s. d.
Sales of Publications	... ... 0 10 6	' NATURALIST ' :—	
' Booth ' Fund for printing	... ... 3 10 0	Members' Copies	173 19 3
Bank Interest	... ... 3 14 9	Exchanges	5 12 6
' NATURALIST ' :—	£ s. d.	Binding	1 8 0
Subscriptions, arrears	15 6 0	Hon. Editor's Postages	7 18 5
" 1926	128 7 0	Stationery, etc....	2 8 6
" 1927	3 16 6	Extra Illustrations	4 14 10
' Cheeseman ' Fund for illustrations	... ... 5 0 0		196 1 6
	152 9 6	Balance, being Excess of Income over Expenditure	23 10 10
Actual Income for year 1926 - £253 12 5			
" Expenditure for year 1926 269 0 0			
All postal, clerical, and other incidental expenses of the Hon. Secretaries, have been defrayed privately.	£292 10 10	E. HAWKESWORTH, <i>Hon. Treasurer.</i>	£292 10 10

BALANCE SHEET, November 22, 1926.

LIABILITIES.	£ s. d.	ASSETS.	£ s. d.
Amounts owing by Union—			
‘Naturalist,’ etc. ...	113 2 3	Cash in Bank ...	303 12 3
Subscriptions paid in advance ...	7 1 0	Cash in hands of Hon. Secretaries ...	4 2 2
Life Members’ A/c ...	150 9 0	Hon. Treasurer ...	0 18 3
‘Hey’ Legacy A/c ...	20 0 0	War “Savings” Certificates, £125	
Balance, being excess of Assets over Liabilities ...	192 0 5	present value say... 152 0 0	
		Subscriptions in arrears, £38 19 0	
		estimated to realise ...	22 0 0
Audited and found correct, Nov. 26th, 1926,	£482 12 8		£482 12 8
ALBERT GILLIGAN. } J. DIGBY FIRTH. } Hon. Auditors.			

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VERTEBRATE ZOOLOGY IN YORKSHIRE.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the Library of the Leeds Philosophical Society on Saturday, February 19th, 1927, Mr. E. W. Wade presiding.

The sectional meeting was preceded by meetings of the Yorkshire Wild Birds and Eggs Protection Acts Committee and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee.

At the General Meeting Mr. Stubbs exhibited the remains of a Kestrel that was stated to have been shot while raiding hen houses in the neighbourhood of Delph; quite possibly the bird was really attracted by mice.

Mr. Booth reported that the Blue-throated Warbler which first visited Scarborough in November, 1925, and which had not been seen since September 19th of last year, had reappeared on February 1st of this year. Mr. Booth also exhibited a nest of the South African Penduline Tit made entirely of merino wool in place of the usual cotton down. The nest was from Natal and was built in Mimosa; locally this species is known as the Kapok bird.

Photographs were shown illustrating the different methods adopted by the Hawfinch, Sparrow and Long-tailed Field Mouse for opening pea pods.

THE WOLF IN YORKSHIRE.

A paper was given by Mr. W. G. Bramley entitled ‘The Wolf in Yorkshire,’ and the lecturer pointed out that the wolf was a serious pest in this country down to the time of Edward I., in whose reign an edict of extermination was made. In Scotland the last wolf was said to have been killed about 1680 by Sir Ewen Cameron at Loch Aber, and also in 1740 by MacQueen of Pall-a-chrocain. In Ireland the last presentment for their destruction was made in County Cork in 1710.

The first real attempt to exterminate the wolf was made in 972 by Edgar, who granted pardons to offenders who could produce a certain number of wolves tongues. The Welsh also were required to pay tribute in the form of 300 wolves heads, which they did for a space of three years.

For three hundred years following the wolves were allowed to increase

until, in the year 1281, Edward I. issued a 'mandamus' enjoining all bailiffs to assist Peter Corbet whom the king has enjoined to take and destroy wolves.

In the reign of Athelstan (A.D. 925) one Achorne, Lord of Flixton, built a hospital or retreat at Flixton for one alderman and fourteen brothers and sisters of that place for the preservation of people travelling that they might not be devoured by wolves and other wild beasts.

About 1160 Roger de Clerc founded a small monastery at Yeddingham near Malton, for his Benedictine nuns, and 'there were delivered to the Prioress sixty-two loaves daily . . . to the dogs in each manor thirty-nine loaves of the coarser sort of bread.' These dogs were probably wolf dogs kept by obligation to protect cattle and people.

In the account books of Whitby Abbey we find it recorded that in 1369 the sum of 1s. 9d. was paid for dressing wolves skins.

No doubt the forests of Galtres, Knaresborough, Pickering and Wensleydale long harboured the wolf, and at Swindon Hall there was an area of 80 yards by 100 yards outside the moat protected by a ditch and trench, and used, no doubt, to protect the cattle from wolves and robbers.

Wolf pits were once common in the Barnsley area, and were frequently referred to in old charters and deeds as 'fovera.' Etymological evidence of the abundance of wolves in Yorkshire is found in Wooldale, near Huddersfield, Wolfares Dunn, near Catterick, Wulsha, Ulveshaw, and Ulshaw Bridge.

Tradition says that the last English wolf was killed by John-o-Gaunt in the Parish of Rothwell, and also by one of the Gowers on the border of the Forest of Galtres. Some colour is lent to the latter tradition, as the Gowers' family crest is a wolf passant argent, and a pennon in Sheriff Hutton Church is said to have been blazoned with a representation of a combat between a man and a wolf.

Topham's edition of Summerville's 'Chase' states that the last place in England to put a price on the head of the wolf was on the Yorkshire Wolds.

On the conclusion of the paper Mr. Wade referred to the burning down of the Scottish forests as a means of getting rid of wolves.

Mr. Chislett stated that there was a price on the head of the wolf in both Finnland and Lapland, but that it was also protected in certain areas.

Mr. Stubbs thought that in the Pennine districts the wolf was formerly regarded merely as a nuisance, as the residents had no instinctive dread of this animal.

Mr. Booth drew attention to the unusual number of Snowy Owls that had recently alighted on ships in the North Atlantic Ocean. It was thought that their numbers must have greatly increased in 1925 when rabbits were unusually plentiful, and that a subsequent scarcity of food had caused a general migration. The scarcity of Fieldfares and Redwings in the West Riding was also referred to, as also the presence right through the winter of Redshanks near Ben Rhydding.

COLOUR IN BIRDS' EGGS AND YOUNG.

The Presidential Address was given by Mr. E. W. Wade and entitled 'The Meaning of Colour in Birds' Eggs and Young.' The lecturer stated that domesticated plants and animals show great colour variations due to artificial selection and complete isolation from the struggle of existence. In wild nature the tendency to vary is ever present, but is held in check by natural laws.

The colour of the eggs of birds has assisted little in their classification, and it is interesting to enquire what controls the colour and what is its meaning. In the first place no relationship will be found between the colour of the eggs and those of the parent, but as birds and reptiles

have a common ancestry it may be safely inferred that the earliest birds laid white eggs.

Birds probably learnt to climb before they learnt to fly, and no doubt the early nests were built in trees and the need for protective colouration did not arise until they had migrated to less protected areas. In this way it is possible to account for the fact that eggs laid in protective situations are generally white and these in exposed situations generally coloured.

If the colour of eggs is determined in this manner, birds nesting in similar situations should lay eggs of the same colour irrespective of species. Exceptions are very numerous, however, and many species lay white eggs in exposed situations and are frequently robbed.

If it is assumed that the next step in colour development was green or blue we might expect to find these colours in nests of a certain type, but actually they are found in both open and concealed nests. Other species build covered nests and lay white eggs marked with red spots, while certain families, such as the Duck and Geese, show a general resemblance in the colour of their eggs.

Some species such as the Red-backed Shrike and Guillemot lay eggs showing a great variety of colour. This is true also of the Tree Pipit, although the closely related Meadow Pipit nests in similar situations and lays eggs of a more or less uniform type.

The Waders as a family follow a consistent protective colour scheme, and the eggs are generally difficult to locate. Speaking generally, however, it is not possible to deduce the nesting site of a bird from a study of the eggs. It will be noted that the greatest efforts of the parent birds are directed to the protection of the young, and the eggs seem to be regarded as comparatively unimportant. Nature's devices for the protective colouration of the young of many species are singularly perfect, and the necessity which compelled eggs in unprotected nests to assume protective colours also compelled the young to be similarly coloured, and to remain motionless on hearing the alarm notes of the parents.

To summarise, many birds still lay white eggs, as did their ancestors, either in concealed nests, or as the result of a change in habits, in open nests. Next we have eggs laid in covered nests showing a little colour. At the other extreme we have birds laying eggs upon the ground in which protective coloration is very pronounced. In between we have a bewildering number of species which conform to no distinguishable colour scheme, but which show a strong tendency to variation.

We can only suppose that in the coloration of eggs, as in the coloration of flowers, nature is always trying new experiments, many of little value to the species, and that such experiments occasionally get out of hand.

The lecture was illustrated by a number of beautiful slides from the lecturer's photographs—many of rare and little known species.

An interesting discussion followed the lecture, and Mr. Chislett thought it no more necessary to explain colour in birds' eggs than in an autumn landscape. Mr. Fysher thought one should be careful in making general deductions from rare species as they were probably rare because they had not conformed sufficiently to nature's laws. Mr. Taylor thought the family resemblance could be traced in the eggs of many birds and that it was little affected by habit. Mr. Procter thought eggs were little prone to vary in colour as only slight variations were found in the eggs of domesticated birds, and Mr. Manley doubted if birds saw colour in the same way as human beings.

Slides of the Kentish and Ringed Plover were shown by Mr. Jasper Atkinson, and the differences between the two species were well shown.

Finally a vote of thanks to the lecturer and the lanternist was carried unanimously.

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(To be continued).

In Memoriam.

JAMES FRASER' ROBINSON.

1857-1927.

FORTY years ago, precisely, the present writer, then a schoolboy, armed with a bag, and a very large coal-hammer, was with his parents on the beach at Withernsea, when Mr. J. F. Robinson, another schoolmaster in Hull, met us, and he and I spent the rest of the afternoon together, looking for 'fossils.' I



found then, for the first time, someone able to answer my many questions relating to geological specimens, and a friendship started, which has been intimate ever since. A few years later, I attended his classes in Botany, and Geology, which were held for many years, under the auspices of the old Hull School Board, and, through his help, early in my 'teens, I held the necessary certificates for teaching both sciences ! From that time to the date of his death, probably no month has passed but we met in the field or at some scientific meeting, where we exchanged opinions on one subject or another.

Mr. Robinson came to Hull, from Northumberland, as Headmaster of one of the then new schools ; later, he was appointed Headmaster at a school where my father formerly wielded the cane ; still later he took charge of an important

new school at Estcourt Street, retiring five years ago. Since then he has kept in touch with his various scientific hobbies, and for some time has had charge of the Wild Flower exhibitions at the Museum.

Mr. Robinson was one of the "all round" type of naturalist, who are becoming exceedingly scarce to-day, and he had a kindly feeling for fellow students, which enabled him always to be at their service, and nothing pleased him more than to interest some young person in natural history. About forty years ago he was one of a small band of enthusiastic naturalists who founded the then Hull Scientific Club, which, later, on the decline of the Hull Naturalists' Society, became the Hull Scientific and Field Naturalists' Club. Of this Mr. Robinson was for many years its President, and from its formation until almost its last meeting, he very rarely missed either an indoor meeting or a field excursion. It was Mr. Robinson who prevailed upon me to take up the Secretarial work in connection with this Society, a position which had much to do with my appointment as Curator of the Hull Museum, when that post became available, over a quarter of a century ago.

Similarly, with the influence of Mr. Adamson and other Yorkshire Geologists who made field geology so popular, Mr. Robinson, with Mr. J. W. Stather, the late Dr. Walton, and one or two others, was instrumental in forming the Hull Geological Society, one of the few societies of its kind which has maintained its amateur spirit ever since.

Mr. Robinson's greatest hobby was that of Botany, and my earliest recollections of the meetings of the Hull Scientific Club were when he took the various botanical specimens brought in by the members, and gave interesting talks on their characters, and named them. He kept careful note-books, in which he recorded the occurrences of different species met with, and eventually he was prevailed upon to prepare the 'Flora of the East Riding,' which was published by the Hull Scientific Club, thus completing the Flora of the County of York, the West Riding previously having been written by F. Arnold Lees, and the North Riding by J. G. Baker, in his 'North Yorkshire.'

In more recent years, the late F. Arnold Lees prepared a manuscript bringing these three floras up to date, in which Mr. Robinson's records are included.

Mr. Robinson was long associated with the Yorkshire Naturalists' Union, and for many years has taken a prominent part in its Botanical Section, in which he has held various offices, and recently has regularly contributed 'Yorkshire Botanical Notes' to the Annual Report of the Union, which has appeared in *The Naturalist*. The same journal has, from time to time, published his particulars of additions to the East Riding Flora.

As an amateur artist, Mr. Robinson made some delightful little sketches, some of which are reproduced in his 'Flora,' and in the writer's 'Geological Rambles in East Yorkshire.' He leaves a widow, four sons and one daughter, to whom all our readers will extend every sympathy. The eldest of these is our contributor, Dr. Wilfrid Robinson, Professor of Botany at the University, Aberystwyth.—T.S.

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Dr. H. H. Thomas, of H.M. Geological Survey, has been elected a Fellow of the Royal Society.

Sir William Bragg has been nominated President of the British Association for the Glasgow meeting in 1928.

At a recent meeting of the Mineralogical Society, Mr. A. Russell gave a 'Notice of the Occurrence of Niccolite and Ullmanite at the Settringstones Mine, Fourstones, Northumberland.'

H.M. The King, who laid the foundation stone of the National Museum of Wales in 1912, will open the building during Easter week. It is estimated that the building, when completed, will have cost a million pounds.

S. S. Buckman's *Type Ammonites*, Part VI., contains illustrations of *Ammonites fibulatus* from the Yorkshire Lias, now called *Peronoceras praepositum*; and also *Ammonites humphriesianus*, now called *Emileites malenotatus*.

The Leeds University authorities are gratified by an intimation that the Miners' Welfare Committee is prepared to make a contribution from the Central Fund of £10,000 towards the cost of erection of a new building for the Mining Department of the University.

The daily press recently contained a photograph of an albino carrion crow which it was stated "was shot on a Yorkshire estate, and during the last five years has been exhibited at the principal museums abroad." Frankly, we find it difficult to believe this, as probably most of the museums possess a better specimen.

In his sixty-sixth year Sir Sidney Harmer retires from the Directorship of the British Museum (Natural History), after forty years' strenuous work in the interest of zoological science; and Mr. Tate Regan reigns in his stead. Dr. William Thomas Calman, F.R.S., has been appointed to succeed Mr. Regan as Keeper of Zoology.

Recent additions to the British Museum (Natural History) include the late Sir Richard Owen's first draft plan embodying his proposals in 1859 for a Natural History Museum, presented by Mr. C. Davies Sherborn; and type specimens of fossil plants from the Inferior Oolite of the Yorkshire Coast, presented by Dr. Hamshaw Thomas.

From an article in *The Yorkshire Herald* it appears that a Hoe, of the Neolithic period, has been found at Marton-cum-Grafton, by a local farmer whose family has resided in the district since before 1660. It has been sent to a Yorkshire Museum where it is the only specimen of its kind, and 'will enable students to commence their researches at a very early period.'

We notice in a recent issue of a catalogue of a well-known bookseller there is offered for sale 10,000 packets of mosses said to be the material from which the late Dr. Braithwaite's 'Moss Flora' was founded. In *The Naturalist* for 1913, page 122, it was stated that the British Museum (Natural History), South Kensington, had acquired Dr. Braithwaite's collection, and this we find to be the case. What has recently been offered for sale is the *omnium gatherum* of species sent to Dr. Braithwaite by various correspondents for determination, etc.

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The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

MYCOLOGY.

After dealing with the 'Arundel Foray' in detail, and the various species of fungi recorded there, *The British Mycological Society* prints in its *Transactions*, just issued, the following valuable notes: 'The Canker Fungus (*Nectria galligena*),' by W. A. R. Dillon Weston; 'The Development of *Geaster velutinus*,' by G. H. Cunningham; '*Nectria rubi*,' by G. H. Pethybridge and R. M. Nattrass; 'The Parasitism of *Plowrightia ribesia* on the Currant,' by Isme A. Hoggan; 'Studies in Entomogenous Fungi,' by T. Petch; 'The Soredia of *Peltigera erumpens* Wain. and *P. scutata* Kbr.,' by O. V. Darbshire; and '*Diaporthe perniciosa*, or a Closely Related Form on Lilac,' by F. C. Deighton.

MARINE BIOLOGY.

We should like particularly to congratulate Dr. Allen and his staff upon the excellent *Journal of the Marine Biological Association* which has just been received.* Among the many valuable contributions are 'The Distribution of Animals Caught in the Ring-trawl in the Daytime in the Plymouth Area,' by F. S. Russell; 'The Phosphorus and Arsenic Compounds of Sea-water,' by W. R. G. Atkins and Edith G. Wilson; 'The Fal Estuary Oyster Beds,' by J. H. Orton; 'Notes on Nucula,' by K. Hirasaka; 'The Eggs and Newly Hatched Young of the Common Blennies from the Plymouth Neighbourhood,' by Marie V. Lebour; 'A New Ciliate, *Ptyssostoma thalassemae* nov. gen., nov. sp., from the Intestine of the Echiroid Worm, *Thalassema neptuni* Gartner,' by C. C. Hentschel; 'The Hydrogen Ion Concentration of the Muscles of Marine Animals,' by K. Furusawa and Phyllis M. T. Kerridge; 'Description of Embryo Rays and Skates,' by R. S. Clark; 'Water Movements in the English Channel,' by J. N. Carruthers; 'Temperature and Enzyme Activity,' by J. R. Baker; 'Factors Responsible for the Death of Fishes in Polluted Waters,' and 'Ability of Fishes to Extract Oxygen at Different Hydrogen Ion Concentrations of the Medium,' both by H. Singh Pruthi; 'A New Habitat for *Loxosoma phascolosomatum*,' by D. Atkins; 'Food and Habits of *Meganyctiphanes norvegica*,' by R. Macdonald; 'Irregular Development in the Larval History of *Meganyctiphanes norvegica*,' by R. Macdonald; 'The Rearing of Crabs in Captivity, with a description of the Larval Stages of *Inachus Dorsettensis*, *Macropodia longirostris*, and *Maia squinado*,' by Marie V. Lebour; and 'Abstracts of Memoirs recording work done at the Plymouth Laboratory.'

* Vol. XIV., No. 3, 10/- net.

BRITISH MITES.

The Ray Society still puts specialists and students under a debt of gratitude for the valuable monographs it produces, which otherwise could never possibly see the light of day. There has just been published Volume II. of 'The British Hydracarina,' by C. D. Soar and W. Williamson, which deals at some length with these rare mites. To workers, however, the gorgeously coloured plates representing these organisms in the beautiful colours which they possess when first caught, and others illustrating various anatomical details, will particularly appeal.

A RABBIT STORY.*

This contains a series of essays dealing with country life. The author describes what might be met with in almost any part of the country, and mammal, bird and plant are equally suitable for his pen. For example : 'Just by the waterfall in the glen, where all was wet and green, were the burrows of several rabbits. The little creatures lived a hard life, for they were hunted on all sides. Fox, fumart and stoat ; sweetmart, wild cat and weasel ; falcon and owl and hawk : they all harried the conies of the hillside. Once, as he lay in the fork of an oak, watching a pair of hen-harriers chasing one another in their courtship gambols, the boy noticed something running about the ground. It was a stoat, and was darting backwards and forwards, evidently trying to pick up some trail. Eventually it succeeded, and trotted along in the direction of the oak, its nose to the ground. As it approached a clump of bracken a rabbit rushed out and knocked it completely off its legs. No sooner did the stoat rise than the infuriated doe darted at it and bowled it over again, till at last the frightened creature ran away. Hidden among the bracken was a young rabbit, and it was the trail of this little wildling that the stoat had followed, with such unexpected result.'

THE ORDNANCE SURVEY.†

Some of the public services have been so long with us that few realise the fascination of their history. It rarely happens also that any particular individual is sufficiently familiar with that history, and sufficiently enthusiastic to prepare it. In the case of Colonel Sir Charles Close, however, at one time Director-General of the Ordnance Survey, he has prepared a wonderful account of the work of the Survey, and reproduces various early samples of mapping, portraits of well-known

* 'The Secret of the Wilds,' by W. R. Calvert (London : Hutchinson & Co., Ltd., 252 pp., 12/6 net).

† 'The Early Years of the Ordnance Survey,' by Sir Charles Close (Institution of Royal Engineers, Chatham, 6/-).

people in the surveying world, and so on. He has an interesting reference to the beginnings of the Geological Survey, and quotes an extract from a letter dated the 16th of May, 1814, from Mudge to Colby :

THE GEOLOGICAL SURVEY.

' On Friday I received a letter from Col. Chapman, grounded on a very good and scientific Representation to the Master General desiring to know whether or not a Mineralogical and Geological Surveyor would not be exceedingly useful to me, as affording means of making those observations in those branches of human knowledge that might help to account for those extraordinary Anomalies which have of late so inconveniently hung round our operations. The Master General at the same time desiring to be informed whether, if such were my opinion, Dr. McCulloch would not be a very good person for the place. My answer was, as you may suppose it was, affirmative all the way through, and I do in consequence expect to have Dr. McCulloch's appointment nominated to me before the present week shall finish its course.'

ORGANISED PUBLICATION.*

The author of this book has many excellent suggestions to make, though much of his ground has already been covered by a Committee of the British Association, which Association, oddly enough, he suggests might take the matter up. If one could get past the author's preambles there is no doubt much to be said for the various recommendations he makes, and unquestionably the size of various scientific publications, classification, method of binding, etc., are suitable subjects for consideration by the different societies and even different countries. The author suggests that the League of Nations might consider the matter. In his Introductory he gives twenty-two numbered sections, a half of one of which we give below :—

CLEARNESS OF DEFINITION.

' Any individual scheme or system has certain specific properties, which for clear thinking one should endeavour to define. In a specific application of the system we could divide these properties into advantages and disadvantages. In another application where the conditions are different, these properties would have to be redivided into another set of advantages and disadvantages. If a person considered a great number of such applications he would probably find some properties consistently advantageous or disadvantageous throughout, and he could then speak of general advantages or

* By J. F. Pownall (London : Elliot Stock, 91 pp., 5/-).

disadvantages. He could also strike a balance and arrive at the generalisation that the system or scheme considered is, or is not, of general utility. . . . Any scheme, system or invention having distinctive properties is worthy of theoretical consideration, because the probabilities are that it will have advantageous applications even if only in special cases. In general, therefore, it is inadvisable to generalise as to the advantage or disadvantage of a scheme without having clear ideas as to its individual applications in various sets of conditions.'

THE PORRITT COLLECTION OF INSECTS.

Mr. Porritt's collection of Macro Lepidoptera (Moths and Butterflies) is one of the finest in Britain, and the specimens, which are in perfect condition, number over 23,000, and are contained in cabinets with 71 drawers. Not only is the collection very extensive, but it includes many series of insects of great biological and scientific interest and of considerable monetary value. It contains 172 specimens, belonging to 18 species which are now extinct in Britain, and there are 434 specimens remarkable for their great rarity in Britain. The Collection is especially rich in named varieties, of which the following are interesting examples:—6 *colias* var. *helice*; 4 yellow *Zygæna filipendula*; 7 *Callimorpha dominula* var. *rosica*; 34 blotched *Spilosoma mendica* from Grimscar Wood, Huddersfield, which so far as is known are unique; 1 *Bombyx callunæ* var. *olivacea* from Meltham Moors; 100 examples of local *Polia chi*, which include all the known variations from light grey to almost black; 22 *Angerona prunaria* varieties of both the brindled and melanic (black) forms, the series being a selection from a great amount of material.

ABRAXAS GROSSULARIATA.

The most remarkable work done by Mr. Porritt in breeding experiments, work unsurpassed by any other entomologist, is shown in five drawers of *Abraxas grossulariata*. This series includes thirty-seven named forms, and all the principal varieties from other parts of the country are represented, it is the extraordinary variety of forms obtained from the gardens of Huddersfield that give to this series its historic and unique value. No fewer than eleven local forms have received special names, and many more are present in the Collection which are worthy of that distinction. It is more than doubtful whether many of these Huddersfield forms will ever be secured again, as most of them were obtained from gardens which have since been destroyed. Mr. Porritt diligently sought to rediscover many of the lost forms, but without success.

NEUROPTERA, ETC.

Dr. Woodhead has issued an appeal for £1000 in order to purchase this collection for the Tolson Memorial Museum at

Huddersfield, which is certainly its natural home, and we are delighted to hear that the appeal has been successful. In addition to the collections of Macro Lepidoptera mentioned above, Mr. Porritt made a large collection of the smaller moths (Micro Lepidoptera). As one of the greatest authorities in Britain on the Neuroptera (Mayflies, Dragonflies, Caddisflies) and Orthoptera (Earwigs, Grasshoppers, Crickets, Cockroaches), he had made nearly complete collections of the British species of these groups, among which local species are very fully represented. These collections, which include over 16,000 specimens, contained in 65 cabinet drawers, have been generously left to the Huddersfield Museum by Mr. Porritt.

BRITISH PLIOCENE AND QUATERNARY VEGETATION.

In the *Svensk Botanisk Tidshrift*, G. Erdtman writes on 'Den Brittiska Vegetationous Pliocena och Kvartara Historia en orientering' ('A Review of the Pliocene and Quaternary History of the British Vegetation'). In this paper Mr. Erdtman refers to the Pliocene Floras of Castle Eden and Cromer; the Inter-glacial Floras of Hoxne and Claxton-on-Sea; the Arctic Plant Beds of the Lea and Cam Valleys; notes on Post Arctic Deposits, etc. He refers to changes of level, pollen statistics, and gives a map of the localities referred to in his memoir. These are principally in Yorkshire, Lancashire and Cheshire, and the Isle of Man.

PRESERVING BOTANICAL SPECIMENS.

At a recent meeting of the Linnean Society, Messrs. E. M. Marsden-Jones and W. B. Turrill gave an account of an improved herbarium method for geneticists, ecologists, and taxonomists. The method demonstrated originated with Professor W. G. Craib, of Aberdeen. It has been used at Kew for some years, and, with minor modifications, is capable of very wide application. With the hope that ecologists and geneticists especially would recognize the necessity of keeping as records the actual specimens with which they have worked, some examples of the results of the method were submitted. Briefly, the process is the sticking-down of the specimens in the living condition. The best results have been obtained with paste, not with gum or glue, 'Gloy' being the best so far tested. A sheet of paper or card is brushed over with a thin layer of the paste, and the specimens placed on this. They are dabbed down and excess of paste wiped away. The sheet is then placed in a press and considerable pressure applied. It is advisable to look at the preparations within a few hours, and remove any excess paste.

'IRONING' PLANTS.

After a few days the specimens are dried; they retain their shape, and sometimes their colour indefinitely. The

most useful results are obtained with dissected flowers and inflorescences ; all parts of the flower can be shown with upper and lower surfaces visible, and sections can also be stuck down for drying in position. With some plants, ironing through blotting-paper with a hot iron gives excellent results. For taxonomy the need for boiling and dissecting is practically eliminated when series like those shown are available. In such a family as Zingiberaceæ and in such a genus as *Iris*, without a method like this, herbarium work is largely hopeless. In genetical studies it has been found most valuable, not only in making ordinary herbarium specimens of entire plants for future reference, but also in having series showing various floral and other organs on cards. In work on *Geum*, herbarium sheets of the distinct forms resulting from the crossing of the British species were prepared, and on cards complete sets of the petals and calyces of all plants raised were kept. A herbarium prepared in this way would become more and more valuable, for no experimental ground is large enough to keep growing all the plants which have been worked with ; but with the above plan a record is preserved. The importance of an ecological herbarium would also be enhanced by adoption of the method or a modification of it.

NATIONAL MUSEUM OF WALES.

The writer of these notes had the privilege of being present at the opening of the National Museum of Wales by His Majesty the King on Thursday, April 21st. So long ago as 1912 he was one of a happy party at Cardiff, when His Majesty laid the foundation stone of that magnificent building, since when the enormous sum of about a million pounds has been spent on the building and its contents. It is not yet complete, many of the galleries having still to be furnished and opened to the public. The Welsh National Museum is indeed a national monument, and situated as it is in the magnificent Cathey Park, surely one of the finest sites in the country, it is worthy of the Principality.

AN OLD BIRD.

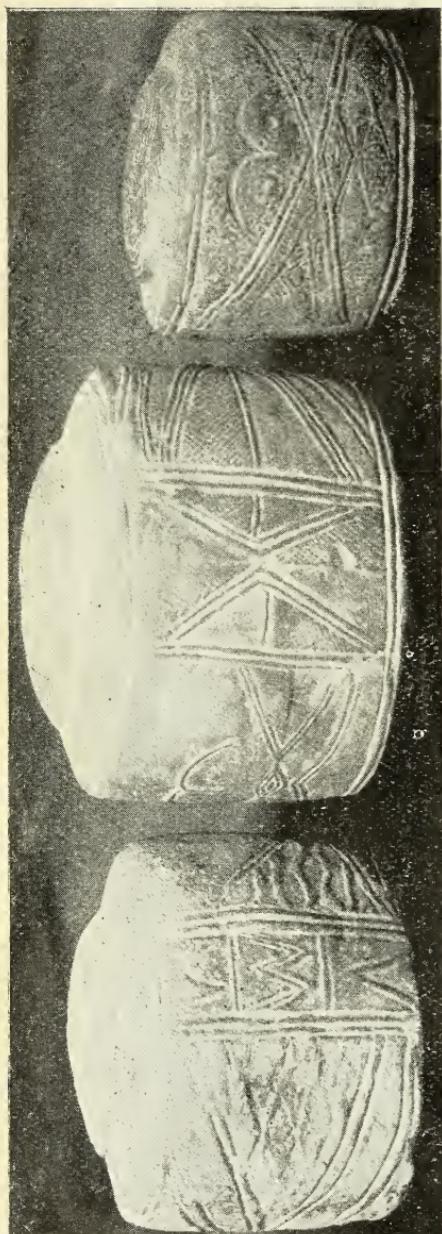
The press recently had a paragraph headed 'A Fifty-year-old Bird.' It seems that a Curlew recently shot at Sheemore, Co. Leitrim, had on one of its legs an aluminium ring with the inscription, 'Museum Goteborg, Sweden, 1869.' Our contributor, Mr. F. W. Edmondson, on communicating with the Director of the Natural History Museum at Goteborg, states that the Curlew was marked at Oland, an island in the Baltic, on June, 1926, and that 1869 D is the number of the marking and not the year of birth. Fifty-two Curlews have been marked in this way, and nine have been returned, all from Ireland.

SCULPTURED CHALK OBJECTS FROM A YORKSHIRE BARROW.

IN '*Archæologia: or, Miscellaneous Tracts*,' Vol. LII., published by the Society of Antiquaries in 1890, the late Canon Greenwell gave results of his 'Recent Researches in Barrows in Yorkshire,' etc., these being supplementary to his well-known work on 'British Barrows.' Among others, he describes a series of Bronze Age barrows on Folkton Wold; of one of these he reports:—

'CCXLV. This barrow, remarkable both in its structure and contents, was situated about three-quarters of a mile east of Sharp Howe. It is 54 feet in diameter, $2\frac{1}{2}$ feet high at the centre, but deeper on the sides, and is placed upon a natural rise in the land. It was composed of very dark-coloured earth, with many flint, chalk, and other stones intermixed. The earth was laid in layers, with thin beds of chalk rubble between them. At a mean distance of 12 feet, but varying from 10 to 15 feet, from the centre, measuring to its inner edge, was a circular trench, varying in depth and width, but with a mean of $2\frac{1}{2}$ feet wide and $1\frac{1}{2}$ foot deep, sunk into the chalk rock, and filled in with earth, having charcoal here and there amongst it. Beyond this trench, at a distance of 8 feet from its outer edge, and extending from a point 22 feet S. by W. from the centre of the barrow to another point at the same distance N. of the centre, was a second trench, somewhat irregular in its curve. It was 2 feet wide and 3 feet deep, and filled in with chalk rubble and a little earth. At a point E. by S. from the centre, and touching the inner edge of the outer trench, of which it might be said to form a part, was an oval grave, lying N. by S., 3 feet long by $1\frac{1}{2}$ foot wide, and sunk 14 inches beneath the surface. It contained the body of a child about five years old, placed about 6 inches above the bottom, laid on the right side with the head to the N., the hands being in front of the face. Behind the head and touching it was an object made of chalk, and behind and touching the hips were two other larger ones, placed closed together, the largest the furthest to the south. Just beyond them was a broken piece of a bone pin, 3 inches long.'

'The chalk objects are made from the stone of the immediate district, probably obtained from some of the numerous blocks, which, falling from the sea cliff, are found abundantly on the shore. They are in form like a round box with a curved cover, and have at the centre of the top a circular part raised a little above the level, and suggesting a lid. They are quite solid. They are respectively, $4\frac{5}{8}$ inches, $4\frac{1}{8}$ inches, and $3\frac{3}{8}$ inches high, and $5\frac{3}{4}$ inches, 5 inches, and



4 inches wide. The top in each case is occupied by a series of concentric circles. The largest one has a single series, consisting of a central disc, surrounded by four raised circular bands. From the outside of the circles issue four triangular points like those of a star, having a plain surface, the space between being filled in with cross-hatching of delicate lines, two formed of squares, one of diamonds, and the fourth by parallel lines. The middle-sized one has four series, each consisting of a central part, and two raised circular bands round it. The smallest has two series similar to the last, but in addition has the whole of the higher central part of the top filled with raised bands, which follow the outline of the two conjoined series of circles. The patterns on the sides, which are well shown in the figures are made by raised bands and incised lines, some crossing and others parallel; some of the raised bands are notched, and in this way divided into small sections, others have something approaching the Mæander upon them.'

The British Museum authorities have kindly agreed to exact facsimiles of these three curious objects being made for the archæological section of the museum at Hull, where they can now be seen.

—:o:—

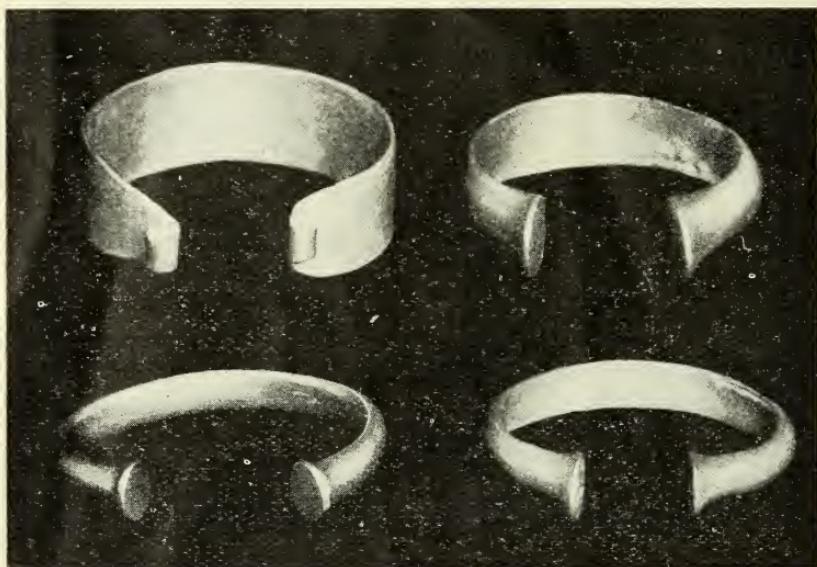
A Laboratory Manual for Elementary Zoology, by L. Henrietta Hyman (London : Cambridge University Press, xviii. + 182 pp., 12/6 net). The fact that seven impressions of this work have appeared before a second edition was called for is some indication of its popularity. The Manual was prepared for a class in elementary zoology in the University of Chicago. The present edition has been entirely re-set, and for the most part re-written, as a result of experience since the first was issued. The author has taken advantage of many enquiries and suggestions made by teachers using the volume.

British Ants : Their Life-History and Classification, by H. St. J. K. Donisthorpe (London : G. Routledge & Sons, Ltd., xv. + 436 pp., 25/-). When we reviewed the first edition of this work (see *The Naturalist*, January, 1916, page 29) the impression we had was that in view of the limited number of students of these forms, and the extraordinary thoroughness of the author's work, there would be little chance of anything further being written on the subject for many years to come. It is all the more gratifying, therefore, to find that within ten years a second edition has been called for, which has enabled the author to bring the matter up to date, as a result of the tremendous progress made in the study of the ants during the decade.

Climate Through the Ages, by C. E. P. Brooks (London : E. Benn, Ltd., 439 pp., 15/- net). Mr. Brooks' remarkable work relating to his researches into the climatic conditions which existed during past geological periods, which has now been before the scientific world for some time, is well known. In the present volume he has summarised and brought together the whole of his researches, and from the evidence in the rocks has deduced various theories as to the climate and weather in different parts of the world during different geological periods. Radiation from the Sun ; Continentality and Temperature ; Precipitation—Rain, Snow and Hail ; The Theory of Continental Drift ; Upper Carboniferous Glacial Period, and many similar topics are discussed.

PREHISTORIC GOLD ORNAMENTS FOUND AT COTTINGHAM, E. YORKS.

FOR many years the 'Gold Room' at the British Museum has had among its treasures some massive solid gold armlets which were found at Cottingham, near the Railway lines, and have been in the National Collection for a considerable number of years. There are four in all, two being found in 1864 and two in 1868. Recently, the British Museum authorities have kindly allowed facsimiles to be made, which are now on exhibition in the Albion Street Museum, Hull, and these have been



Prehistoric Gold Ornaments from Cottingham, E. Yorks.

so excellently carried out by Mr. A. P. Ready, the well-known expert, that it is difficult to realise they are not the actual gold objects themselves.

Obviously, the armlets represent a hoard of a Goldsmith or trader of the Bronze Age, and they may be looked upon as at the very least three thousand years old. Objects of this sort occasionally occur in different parts of the British Islands, notably in Ireland, and, as will have been seen from the press, a fine example was found at Selsey, in Sussex, quite recently. These four, however, are the only ones of their kind known to have been found in this area, and they are the only gold prehistoric objects of importance ever found in the East Riding.

The accompanying photograph gives an idea of the nature

of the armlets, each of which is penannular and large enough for an adult wrist.

Specimen No. 1 is of flat ribbon-like gold, 1 inch in width for the most part, gradually narrowing towards the ends, which are beaten over in the form of coils; the whole very much resembling a miniature 'stand-up' starched collar. If the ribbon was flattened out it would measure about 9 in. in length. The weight is 2 oz. 11 dwt.

Specimen No. 2 is the most massive of all, and, as with Nos. 3 and 4, very much resembles the familiar bronze ring-money from West Africa, having the terminals hammered into trumpet-like forms. In section the object is flat on the inside, convex on the outside, is $\frac{3}{4}$ in. in width, and is fairly sharp on the edges. The measurement if straightened out would be 7 in.

No. 3 is similar to the preceding, but the convex outer surface has a slight keel or ridge. The trumpet ends are also rather nearer together, being only $\frac{3}{4}$ in. apart, whereas those of No. 2 are over an inch apart. In this case the length is $6\frac{3}{4}$ in.

No. 4 differs from either of the preceding, inasmuch as it is oval in section, though the outer surface is slightly more convex than the inner, and the trumpet ends are oval and not concentric as in the other cases. They are also $1\frac{1}{4}$ in. apart. The length of this armlet is $6\frac{3}{4}$ in. and the weight is 4 oz. 7 gr. This specimen is slightly warped or bent out of the straight line.

It will thus be seen in these objects alone there is a quantity of solid native pure gold weighing about a pound. As these specimens were found in the same place, but at different times, it is more than possible that there are other examples existing in the vicinity, as usually when hoards of gold ornaments of this character occur, there are quite a number of examples discovered.—T.S.

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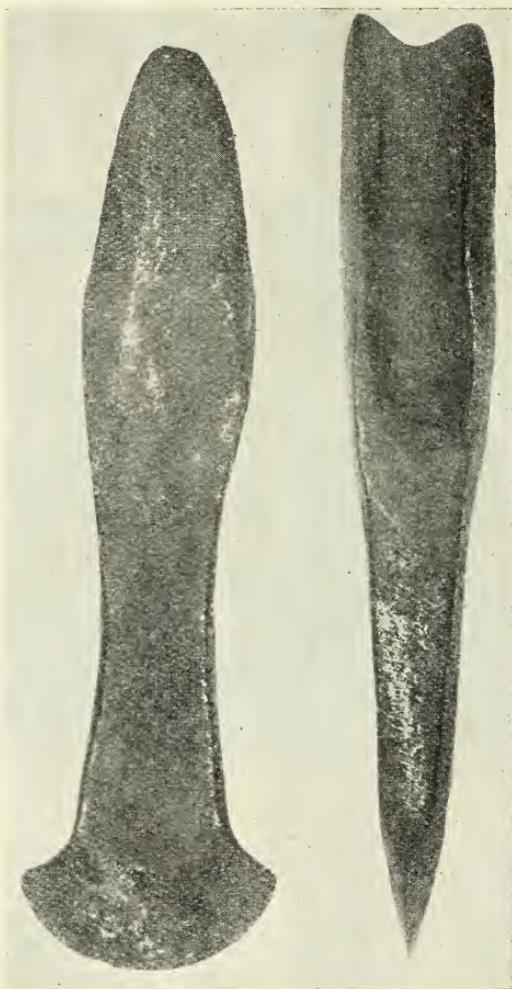
Hymenoptera in East Yorks.—I obtained *Inostemma boscii*, parasitic upon the Pear Tree Midge at High Dalby (Thornton Dale), and *Agriotypus armatus*, one of the parasites, on Caddis larvæ at Wansford, near Driffield.—H. M. FOSTER, Hull.

A Carnivorous Sawfly.—The cannibal propensities of the common Sawfly, *Allantus arcuatus* Forst., are well known, but one evening in a lane near Carlisle I found an individual of this species sitting in a Buttercup flower devouring the abdomen of an *Empis* fly. The *Empis* in turn had its proboscis deeply inserted into the side of the thorax of a species of *Dolichopus*. Both flies were alive but quite passive, suggesting that insects do not feel pain as we understand it.

—JAS. MURRAY, Gretna.

RARE BRONZE AGE IMPLEMENT AT MESSINGHAM

An object of particular rarity has recently been found near Messingham, in Lincolnshire. It is a particularly delicately-formed axe of the Bronze Age, probably at least three thou-



sand years of age, but it is remarkable from the fact that it is hafted so as to be used in the form of a chisel or adze, a very rare form indeed.

The late Sir John Evans, author of the well-known standard work on British Bronze Implements, states that 'Palstaves of the adze form, or having the blade at right angles to the septum between the flanges, are but very seldom found in Britain.' He then illustrates one from Irthington, Cumber-

land, and one from North Owersby, Lincolnshire, as evidently the only two examples found in England. These, however, are fairly straight in the shaft and might easily pass as chisels. The recent discovery, however, has a well-sharpened semi-lunar cutting edge, and is very similar to an Irish example figured in Sir John Evans' work.

The present specimen is $4\frac{1}{4}$ inches long ; the cutting edge is slightly over $1\frac{1}{2}$ inches in length, and the implement weighs 5 oz. It has been placed among the large collection of north country bronzes in the Museum at Hull.—T.S.

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A further socketed celt of the usual wedge-shaped type has recently been purchased for the museum. It was found at North Cave, some years ago, and is very similar in type to those from Everthorpe, figured in this journal for July, 1923. It is $3\frac{1}{2}$ inches long, $1\frac{1}{2}$ inches across the top, the cutting edge measures $1\frac{3}{4}$ inches, and it weighs 3 oz.—T.S.

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A particularly useful **Guide to the Crustacea in the Department of Zoology, British Museum (Natural History)**, which contains eighty pages with nearly as many excellent illustrations, has been issued at the nominal price of one shilling. The Guide has been written by Dr. W. T. Calman, F.R.S., and contains descriptions of some of the more remarkable examples of the Arthropoda.

British Wild Fruits, by Richard Morse, F.L.S. London : The Epworth Press, 1927, 64 pp., 1/6 net. This recent addition to the 'How to Identify' Series gives simple descriptions of fifty-six of our commoner fleshy fruits, and it is intended to 'provide for the veriest beginner in field botany sufficient information to enable him to identify the great majority of the wild "fruits" which he is likely to encounter in his rambles across the fields.' There are fourteen excellent illustrations from photographs, one in colour and twenty-eight line drawings.

A Botanist in the Amazon Valley, by R. Ruggles Gates. London : H. F. & G. Witherby, 1927, 203 pp., 7/6 net. This account of a six weeks botanising tour in the Amazon Valley makes an interesting and very readable story, though much of it is written in the form of notes on the way, and of passing observations on the plants and animals met with, also the peoples and their customs. During the tour about 150 photographs, and 3000 feet of film were taken, chiefly of the different types of vegetation. Twenty-three of these are included in this volume to illustrate the dense tree growth, the trunks festooned with creepers, and the branches clothed with innumerable epiphytes. In addition to the general narrative, the three concluding chapters are devoted to more systematic account of the Amazon palms and other trees ; woods and timbers of the Amazon region ; and the people. In the latter the author has some interesting observations on the results of crossing between the races, which has been going on throughout the whole history of South America, the people being a mixed race compounded of Portuguese, Indian and negro blood. Recent evidence indicates the occurrence of segregation in such features as eye-colour and skin-colour, but with complications due to there being more than one inheritance factor for each colour, and his observations suggest that there is independent segregation and recombination between different pairs of factors in mixed human races. As to the exploitation of the vast timber resources of the region, the author thinks this is still distant.

FIELD NOTES.

Water Beetles near Seascale.—In July, 1917, I found a large shallow pool on the sandhills near Sellafield Station. Beetles were abundant in it, but I was only able to secure about twenty specimens. These were made up of the following species : *Haliplus lineatocollis*, *Cælambus inequalis* and *C. confluens*, several of each ; *Doronectes depressus*, a pair ; *Hydroporus rivalis*, one ; *H. palustris*, several ; *Helophorus ænipennis*, one ; and *Cercyon lateralis*, one. In 1919 and 1921 this pond was dried up and devoid of insect life.—JAS. MURRAY, Gretna.

Marine Life near Scarborough.—In September last my brother and I found on the deck of a local trawler the remains of two Rosy Feather Stars (*Comatula rosacea*). They were caught off Robin Hood's Bay. On 30th December, 1926, the Octopus, *Eledone cirrhosa*, was caught thirty miles out to sea from the deck of a local trawler. On 3rd January, 1927, I procured a specimen of the shell, *Trophon clathratus*, from forty-five miles north-east of Scarborough. On 12th January, 1927, from the deck of another trawler, I procured a large living female pebble crab, *Ebalia pennantii*, also from off Robin Hood's Bay. I have kept it alive up to date. On the same day I procured from the same boat a beautiful female cleanser swimming crab (*Portunus depurator*). It was also alive. On 11th January, 1927, from forty-five miles north-east of Scarborough (Barnacle Bank), I procured a perfect young specimen of the mussel, *Crenella nigra*. On 17th January, I obtained a little Cuttle (*Sepiola rondeletii*) from off Robin Hood's Bay. Later on I found two or three more. I have never before seen them here. On 17th Jan., lying on the market, I found a much mutilated, though easily recognizable specimen of the Skate Leech (*Pontobdella muricata*), while on the 6th March we secured from the gills of the Long-Spined Sea Bullhead a small specimen of the other local Leech (*Pontobdella marina*). While at the harbour on March 1st I photographed a large Turbot (about 1 stone), which was dark-coloured on both sides. It also had a curious knob on its head above the upper eye. On 5th December, 1926, while rock-pool hunting, I captured a half-grown male specimen of the little, beautifully-coloured crab, *Pirimela denticulata*. I have kept it alive since then, and it seems to be thriving, though very sluggish. On Thursday last (March 24th) I procured a beautiful male specimen of the Velvet Fiddler (*Portunus puber*), which was caught in a crab-pot near Robin Hood's Bay. This appears to be the second occurrence of this common Southern form in this locality. I have preserved it.—J. A. STEVENSON.

ADDITIONS TO THE YORKSHIRE DIPTERA LIST.

CHRIS A. CHEETHAM.

THE last supplementary list was in the March, 1926, issue, page 85. The following have been published or identified since that time.

The large number (104) is due to Mr. F. W. Edwards' visit and to Mr. W. J. Fordham's paper.

The initials in brackets refer to referees (Messrs. J. E. Collin, F. W. Edwards, P. H. Grimshaw, and C. J. Wainwright), who have identified the particular fly. To these gentlemen we again tender our heartiest thanks. Initials not in brackets are those of the collector, and where there are none they are my own records.

There are a few errors in previous lists which require correction, viz. :—

Ceromasia auripila B. and B. (*Nat.*, 1926, p. 60). I since submitted to Mr. Wainwright, who refers it to *Lydella (Ceromasia) stabulans* Mg.

Cerodonta spinicornis Mcq. (*Nat.*, 1923, p. 409). I find I misread Mr. Collin's ticket, it should be *C. denticornis* Pz.

Phora abdominalis Fln. (*Nat.*, 1921, p. 309). When returning Mr. Fordham's insect, Mr. Collin states that the previous record should have been *P. florea* F.

In Mr. Fordham's paper, *Lydella nigripes* Fal. is already in the list as *Ceromasia machairopsis* B. and B., and *Macquartia tenebricosa* Mg. as *nubilis* Rnd.

Zygoneura sciarina Mg. Coverdale, 2/8/26.

Scatopse geniculata Ztt. Crag Wood, 29/6/25 (F.W.E.).

Psectrosciaro (Scatopse) coxendix Verr. Adel, 30/6/25 (F.W.E.).

Chironomus arundineti Goet. Gormire, 5/7/26 (F.W.E.).

C. viridis ?Mcq. Gormire, 5/7/26 (F.W.E.).

C. cinctellus Goet. Castle Howard, 4/7/26, F.W.E.

Tanypus (sens. lat.) nemorum Goet. Skipwith, 3/7/26, F.W.E.

T. " *nervosus* Mg. Castle Howard, 4/7/26, F.W.E.

T. " *viliopennis* Kieff. Castle Howard, 4/7/26, F.W.E.

T. " *longipalpis* Goet. Castle Howard, 4/7/26, F.W.E.

T. " *nugax* Wlk. Gormire, 5/7/26, F.W.E.

T. " *melanurus* Mg. Gormire, 5/7/26, F.W.E.

T. " *falciger* Keiff. Gormire, 5/7/26, F.W.E.

T. " *trifascipennis* Ztt. Boltby, 6/7/26, F.W.E.

T. " *triannulatus* Goet. Boltby, 6/7/26, F.W.E.

T. " *carneus* F. (var.). Boltby, 6/7/26, F.W.E.

T. " *dubius* Staeg. Hawnby, 6/7/26, F.W.E.

Orthocladius vernalis Goet. Crag Wood, 8/7/26, F.W.E.

Forcipomyia (Ceratopogon) ? pallida (Winn.). Boltby, 6/7/26, F.W.E.

Culicoides " *pictipennis* (Staeg.). Castle Howard, 4/7/26, F.W.E.

Isohelea " *sociabilis* (Goet.). Skipwith, 4/7/26, F.W.E.

Stilobezzia " *gracilis* (Hal.). Crag Wood, 7/7/26, F.W.E.

Clinohelea " *unimaculata* Mcq. Gormire, 5/7/26, F.W.E.

Johannsenomyia " *nitida* (Mcq.). Castle Howard, 4/7/26, F.W.E.

- Dicrobezzia (Ceratopogon) venusta* (Mcq.). Castle Howard, 4/7/26, F.W.E.
- Palpomyia* , *semifumosa* Goet. Gormire, 5/7/26, F.W.E.
P. , *nemorivaga* Goet. Gormire, 5/7/26, F.W.E.
P. , *praestra* (Lw.). Hawnyby, 6/7/26, F.W.E.
P. , *nigripes* (Mg.). Hawnyby, 6/7/26, F.W.E.
P. , *distincta* (Hal.). Hawnyby, 6/7/26, F.W.E.
P. , *serripes* (Mg.). Gormire, 5/7/26, F.W.E.
P. , *fulva* (Mcq.) (*ferruginea*). Gormire, 5/7/26, F.W.E.
- Bezzia* , *gracilis* (Winn.). Skipwith, 4/7/26, F.W.E.
B. , *solsstitialis* (Winn.). Castle Howard, 4/7/26, F.W.E.
B. , *rubiginosa* (Winn.). Castle Howard, 4/7/26, F.W.E.
B. , *nobilis* (Winn.). Castle Howard, 4/7/26, F.W.E.
- Culicella fumipennis* Stph. Wistow, 3/7/26, F.W.E.
Dixa amphibia DeG. Gormire, 5/7/26, F.W.E.
Dicranomyia pilipennis Egg. Crag Wood, 7/7/26, F.W.E.
Thaumastoptera calceata Mik. Crag Wood, 24/6/26.
Goniomyia recta Tonn. Coverdale, 2/8/26.
Gnophomyia tripudians Brgr. Castle Howard, 3/7/26, F.W.E.
Chilotrichia imbuta Mq. Austwick, 26/6/26.
Rhamphidia flava Wlk. Mean Wood, 19/6/25 (F.W.E.).
Rhamphomyia eryophthalma Mg. Farnley, 25/8/25 (J.E.C.).
Empis aestiva Lw. Gormire, 5/7/26.
Edalea stigmatella Ztt. Crag Wood, 22/6/26.
Tachydromia pallidiventris Mg. Coverdale, 2/8/26 (J.E.C.).
Hercostomus metallicus Stann. Wistow, 3/7/26.
Achalcus flavicollis Mg. Hawnyby, 6/7/26, F.W.E.
Platycnema pulicaria Fln. Hawnyby, 6/7/26, F.W.E.
Agathomyia antennata Ztt. Crag Wood, 22/6/26.
Platypeza furcata Fln. Crag Wood, 22/6/26.
Pipunculus haemorrhoidalis Ztt. Austwick, 5/6/26.
P. strobli Verr. Holme on S.M., W.J.F. (J.E.C.).
Pipiza (?) signata Mg. Allerthorpe, W.J.F. (J.E.C.).
Liogaster splendida Mg. Castle Howard, 3/7/26.
Carcelia comata Rnd. Allerthorpe, W.J.F. (C.J.W.).
Meigenia bisignata Mg. Allerthorpe, W.J.F. (C.J.W.).
Lydella (Ceromasia) stabulans Mg. Allerthorpe, W.J.F. (C.J.W.).
Exorista glauca Mg. Allerthorpe, W.J.F. (C.J.W.).
Epicampocera succincta Mg. Allerthorpe, W.J.F. (C.J.W.).
Anachætopsis ocypterina Ztt. Allerthorpe, W.J.F. (C.J.W.).
Brachycoma devia Fln. Allerthorpe, W.J.F. (C.J.W.).
Sphecapata (Sphixapata) conica Fln. Allerthorpe, W.J.F. (C.J.W.).
Sarcophaga crassimargo Pnd. Allerthorpe, W.J.F. (C.J.W.).
S. vicina Vill. Bubwith, W.J.F. (C.J.W.).
S. striata Mg. Filey, W.J.F. (C.J.W.).
Melanota volvulus F. Forge Valley, W.J.F. (C.J.W.).
Phaonia humerella Stein. Boltby, 6/7/26 (J.E.C.).
Trichopticus hirsutulus Ztt. Gormire, 15/6/21.
Mydæa allottalla Mg. Wistow, 4/8/26.
M. abdominalis Ztt. Austwick, 28/6/26.
M. nivalis Stein. (*latitarsata* Rngd.) Thorns Ghyll, 2/6/25 (J.E.C.).
M. maculipennis Ztt. Middleham, 1/8/26 (J.E.C.).
M. fratercula Ztt. (*spinifemorata* Mde.). Whernside, 28/7/22 (J.E.C.).
Limnophora exsurda Pnz. Coverdale, 2/8/26 (J.E.C.).
Spilogona brunneisquama Ztt. Coverdale, 2/8/26 (J.E.C.).
S. contractifrons Ztt. Heseltine Ghyll, 13/6/25 (J.E.C.).

- Acroptena (Hydrophoria) caudata* Ztt. Wistow, 4/8/26.
Hylemyia cinerosa Ztt. Adel, 15/6/25 (J.E.C.).
H. pilipyga Vill. Crag Wood, 2/9/25 (J.E.C.).
H. præpotens Wd. Allerthorpe, 5/9/23.
Prosalia (Chortophila) silvestris Fln. Allerthorpe, 21/6/26 (J.E.C.).
Pegomyia femorata Stein. Crag Wood, 6/6/21 (J.E.C.).
Lasiops eryophthalma Ztt. Farnley, 8/26 (J.E.C.).
Chirosia albiparsis Ztt. Allerthorpe, 21/6/25.
Cordylura umbrosa Lw. Askham, 6/25, W. D. Hincks.
Suilla (Helomyza) affinis Mcq. Coverdale, 31/7/26 (J.E.C.).
Ectinocera borealis Ztt. Austwick, 25/6/26.
Hedroneura (Elgiva) cucularia L. Castle Howard, 3/7/26.
Zonosema (Spilographa) alternata Fln. Shelley, Dr. Smart (J.E.C.).
Tephritis parietina L. Clifton Ings, W.J.F. (J.E.C.).
T. leontodonitis De G. Gormire, 4/7/26.
Saltella sphondylii Schrnk. Austwick, 17/7/20 (J.E.C.).
Piophila luteata Hal. Wistow, 4/8/26 (J.E.C.).
Chlorops scalaris Mg. Wistow, 4/8/26 (J.E.C.).
C. brevimanus Lw. Bubwith, W.J.F. (J.E.C.).
C. meigenii Lw. Askham, W.J.F. (J.E.C.).
Phytomyza (Chromatomyia) ilicis Curt. Austwick, 8/26, (J.E.C.).
Borborus pedestris Mcq. Bubwith, W.J.F. (J.E.C.).
Phora abdominalis Fln. Allerthorpe, W.J.F. (J.E.C.).
P. fasciata Fln. Skipwith, W.J.F. (J.E.C.).
Aphiochæta longicostalis Wood. Wistow, 2/7/26.

The following have been identified since the above was written, and will make the number of additions 115.

- Tanytarsus sexannulatus* Goet. Stainforth, 27/3/27 (F.W.E.).
Chersodromia hirta Wlk. Spurn, 3/8/19.
Mydaea denudata Ztt. (*fratercula* Meade nec. Ztt.). Allerthorpe (J.E.C.).
Lispocephala alma Mg. (*C. ungulata* Rnd.). Skipwith, 5/4/26.
Dialyta (Spilogaster) halterata Stein. Gormire, 13/6/21; Askham, 20/6/25 (J.E.C.).
Spilogona (Limnophora) litorea Fal. Austwick, 10/7/26.
S. curata Coll. Whernside, 11/8/22 (J.E.C.).
Chortophila varicolor (Mg.) Coll. Thorner, 21/6/24 (J.E.C.).
C. grisea Rngdw. Austwick, 26/5/26 (J.E.C.).
Cænosia decipiens Mg. (*pedella* Fal.). Whernside, 11/8/22.
Discocerina obscurella Fln. Farnley, 26/2/27.

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A Third Edition of the useful 'Handbook to the Marine Aquaria,' at the Horniman Museum, London, has been issued.

In *The Yorkshire Post* for April 22nd is an admirable leading article on 'Museums and their Importance.'

The Report of the Public Museums and Mappin Art Gallery, Sheffield, covering the period from March 26th, 1919, to March 25th, 1926, has been published.

A still further instalment (Part XII.) of Davies Sherborn's *Index Animalium* has appeared. This contains the words *haani-implicatus* with full bibliographical details.

J. B. Duncan contributes 'The Mosses and Hepaticas of Berwickshire and North Northumberland' to Part I. of Vol. XXVI. of *The History of the Berwickshire Naturalists' Club*.

We regret to notice a record of the death of Richard Mason, one of the oldest solicitors in Lincolnshire, who practiced in that capacity in Grimsby for fifty-two years. He was keenly interested in natural history, and an authority on angling in its various branches.

YORKSHIRE BRYOLOGISTS AT MELTHAM.

F. E. MILSOM.

ON November 20th an enthusiastic party of bryologists met at Meltham, and, in spite of a day which was intermittently damp, had a very enjoyable time. The range of *Orthodontium gracile* var. *heterocarpum* was further extended, it being found both on the moors and the lower part of tree trunks. Of the hepatics, the best find was *Lophozia incisa*. The ground traversed was Royd Edge Brow and Magdalen Clough, returning down Harden Clough, though this latter was not worked. The following is a selection of the mosses and hepatics found :—

MOSSES.

<i>Orthodontium gracile</i> var. <i>heterocarpum</i> .	<i>Webera proligera</i> .
<i>Oligotrichum hercynicum</i> .	<i>Hyocomium flagellare</i> .
<i>Rhacomitrium heterostichum</i> .	<i>Hypnum uncinatum</i> .
<i>Grimmia apocarpa</i> .	<i>H. stramineum</i> .

HEPATICS.

<i>Lophozia incisa</i> .	<i>L. Floerkii</i> var. <i>naumanniana</i> .
Mr. W. E. L. Wattam reports that the following Lichens were noted along Royd Edge Brow and up Magdalen Clough, most of which are typical species in the valleys intersecting the Pennine range of S.W. Yorks. (V.C. 63), viz. :—	
<i>Parmelia saxatilis</i> Ach., with its form <i>furfuracea</i> Schaer. Sandstone blocks and boulders.	
<i>Candelariella vitellina</i> Müll.-Arg. Sandstone boulders.	
<i>Lecanora muralis</i> Schaer. Common on sandstone walls, blocks, and basal boles of birch.	
<i>L. galactina</i> Ach., sub-sp. <i>dissipata</i> . Sandstone blocks.	
<i>L. varia</i> Ach. Dead stems of Ling.	
<i>L. conizae</i> Nyl. Boles of Hawthorn.	
<i>L. polytropa</i> Schaer. Sandstone blocks.	
<i>Bæomyces rufus</i> D.C. Pieces of sandstones in the stream. Not common.	
<i>Cladonia pyxidata</i> Hoffm. and var. <i>pocillum</i> Fr. Among mosses on peaty humus.	
<i>C. fimbriata</i> Fr. Similar habitat.	
<i>C. gracilis</i> Willd. Similar habitat, and var. <i>chordalis</i> Floerke under ling.	
<i>C. coccifera</i> Willd. and f. <i>phylloloma</i> Flk. On bare peat, and peaty humus on sandstone blocks.	
<i>C. macilenta</i> Hoffm. On peaty humus.	
<i>C. floerkeana</i> Fr. On peat.	
<i>Lecidzia coarctata</i> Nyl. Sandstone walls.	
<i>L. granulosa</i> Schaer. On peat.	
<i>L. uliginosa</i> Ach. On peat.	
<i>L. contigua</i> Fr., and var. <i>platycarpa</i> Fr. Sandstone blocks and boulders.	
<i>L. lithophila</i> Ach. Sandstone blocks of stream bed.	
<i>Bilimbia sabuletorum</i> B. and R. On mosses growing on peaty humus on sandstone blocks.	

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Mr. W. M. Wright has the following note in *Lincolnshire Notes and Queries* for July, 1926: 'An old bell in St. Stephen's Church, Grimsby. Some years ago this bell was fished up by a trawler from the North Sea. The Reverend Cyril Bond, hearing that it was lying in a fisherman's back yard, happily secured it for his church. The bell, which is 13 ins. diameter, has mouldings of the Crucifix, the Virgin and Child, a bishop in mitre with staff, and another figure with staff, possibly an abbess. An inscription round the top runs "LAUS DEO SEMPER, 1783." Where can this bell have come from? How did it get to the bottom of the North Sea?' A photograph might have thrown light on the matter.

YORKSHIRE HEMIPTERA FOR 1926.

JAMES M. BROWN, B.Sc., F.L.S., F.E.S.

A CONSIDERABLE extension of known localities can be made as the result of the past season's collecting, some of the North Yorkshire Dales having been worked, apparently for the first time.

I have again to thank Rev. C. D. Ash and Messrs. R. Butterfield, W. D. Hincks, T. B. Kitchen, M. L. Thompson and G. B. Walsh for the opportunity of examining specimens.

†=New to the County. * =New to the Vice-county.
Uninitialled records are my own.

HETEROPTERA.

Elasmostethus interstinctus L. Beaten from birch near York, C.A. 64*.

Elasmucha (Elasmostethus) grisea L. Beaten from birch near York, C.A. 64*.

Nysius thymi Wolff. Eshton, M.L.T.

Piesma maculata Latr. (*capitata*). Blackhills, W.D.H. 64*.

Ploiariola vagabunda L. Commonly beaten from ivy, Keighley, R.B. 64*.

Nabis rugosus L. Kildale and Arncliffe, M.L.T.

N. ericetorum Scholtz. Occurs frequently among heather, Hawnley, M.L.T.

Acanthia (Salda) scotica Curt. Redmire, M.L.T. At Aysgarth this species was swarming on the rocks below the falls in August.

Salda morio Zett. Keighley, R.B. This species and *S. muelleri* Gmel., which I reported last year from Goathland, are very closely related, and appear to be frequently confused with each other, so that it is doubtful to which the early records noted in *The Naturalist*, 1921, p. 336 really refer. I have compared both insects recorded by me with specimens in the British Museum.

Lyctocoris campestris F. Occasionally appears in houses, Ecclesall, Sheffield.

Acompororis pygmaeus Fall. On firs, Coverdale. 65*.

Anthocoris confusus Reut. Reeth.

A. nemorum L. Reeth and Richmond.

Pithanus märkeli H.S. Among grass, Coverdale.

Teratocoris saundersi D. and S. Occasionally occurs among damp vegetation, Grinton, M.L.T.; Bolton Woods, Wensley.

Monalocoris filicis L. Plentiful on bracken, Arncliffe Woods, M.L.T.; Keighley, R.B.

Phytocoris ulmi L. Keighley, R.B.; Redmire, M.L.T.; Kiveton Park.

P. pini Kb. Leyburn. 65*.

P. dimidiatus Kb. Keighley, R.B.

Calocoris ochromelas Gmel. Kildale, M.L.T.

C. roseo-maculatus De G. Eshton, M.L.T.

C. sex-guttatus F. Richmond and Reeth. 65*.

C. norvegicus Gmel. Eshton, M.L.T.; Richmond, Leyburn.

Capsus ater L. Swept from grass, Kiveton Park.

Lygus pabulinus L. Richmond.

L. pratensis L. Richmond and Reeth.

Camptozygum pinastri Fall. On firs, Witton Fell. 65*.

†*Orthocephalus mutabilis* Fall. One female of this interesting addition to the county fauna taken in Forge Valley, G.B.W.

Dicyphus constrictus Boh. Usually taken on *Lychnis*, Raincliffe Woods, G.B.W.

D. errans Wolff. Bolton Woods, Wensley. 65*.

D. globulifer Fall. Raincliffe Woods, G.B.W.

D. annulatus Wolff. Common on *Ononis*, Scarborough, G.B.W.

Campyloneura virgula H.S. Generally obtained on oaks, Leyburn, Coverdale, Witton Fell. 65*.

Blepharidopterus angulatus F. Richmond.

Mecomma ambulans Fall. This species shows very pronounced dimorphism, the females being apterous, Richmond. 65*.

Cyllocoris flavonotatus Boh. Castle Howard, M.L.T.; Allerthorpe, W.D.H.

Orthotylus marginatus Reut. Frequent on sallows, Witton Fell, Bolton Woods, Leyburn. 65*.

O. viridinervis Kb. Beaten from elms, Witton Fell, Leyburn. 65*.

Heterocordylus tibialis Hahn. Plentiful on gorse, Allerthorpe. 61*.

Malacocoris chlorizans Fall. A delicate species living on hazel, Coverdale, Richmond. 65*.

Plagiognathus arbustorum F. Richmond.

P. chrysanthemi Wolff. Redmire, M.L.T.; Richmond.

†*Chlamydatus* (*P.*) *pullus* Reut. (*pulicaris*). This is one of the less conspicuous Capsids taken by sweeping among damp vegetation, and is another addition to the county, Richmond.

Arctocoris a lugubris Fieb. Greatham, M.L.T.

HOMOPTERA.

Philænus spumarius L. f. *lateralis* L. Richmond.

P. spumarius L. f. *lineatus* Fab. Richmond.

P. campestris Fall. Penn Hill. 65*.

P. exclamationis Thumb. Penn Hill.

P. lineatus L. Keighley, R.B.

Ulopa reticulata Fab. An inconspicuous species living among heather, Kildale, M.L.T.

Megophthalmus scanicus Fall. Richmond.

Euacanthus interruptus L. Reeth, Richmond.

Batrachomorphus lanio L. Coverdale. 65*.

†*Macropsis impura* Boh. On *Salix repens*, Allerthorpe.

Agallia puncticeps Germ. Kiveton Park.

Acocephalus nervosus Schr. Richmond.

Athyranus sordidus var. *piceus* Scott. Swept from damp vegetation, Coverdale. 65*.

A. plebejus Fall. Richmond. 65*.

Deltoccephalus striatus L. Coverdale. 65*.

D. thenii Edw. Keighley, R.B. These two species are very nearly related and are only distinguished by the form of the aedeagus.

D. punctum Flor. Both the short-winged and the much less common long-winged forms, Carlton Beck, Coverdale. 65*.

D. abdominalis Fab. Plentiful on the Buttertubs Pass. 65*.

D. pascuellus Fabr. Richmond, Coverdale. 65*.

D. pulicaris Fall. Richmond, Witton Fell.

Thamnotettix croceus H.S. Among dry grass, Scalby High Moor, G.B.W. 62*.

†*Limotettix striola* Fall. By sweeping grass, Eshton, M.L.T.

L. intermedia Boh. Grinton M.L.T. 62*. This species has previously been reported only from Eshton.

L. lunulifrons J. Sahlb. Among damp vegetation, Redmire, Carlton Beck. 65*.

L. persimilis Edw. Richmond. 65*.

L. sulphurella var. *lutea* Edw. Richmond, Coverdale. 65*.

L. (Stictocoris) flaveola Boh. By sweeping among damp vegetation, Witton Fell. 65*. Only reported previously from Wentworth.

- Alebra albostriella* Fall. Coverdale. 65*.
Dikraneura flavipennis Zett. Allerthorpe.
D. similis Edw. Carlton Beck. 65*.
D. molliculus Boh. Carlton Beck. 65*.
D. variata Hdy. Allerthorpe. 61*.
Empoasca smaragdula Fall. Keighley, R.B.
Eupteryx germari Zett. On firs, Leyburn, Witton Fell. 65*.
†*T. avellanae* Edw. Keighley, R.B., Leyburn Shawl, Witton Fell. 65*.
T. nitidula Fab. Coverdale. 65*. Previously taken at Sandsend.
†*T. avellanae* Edw. One of the pale yellow species, only determined by the structure of the aedeagus, Richmond.
Zygina alneti Dahl. Richmond. 65*.
Cixius cunicularius L. Keighley, R.B.
Dicranotropis hamata Boh. The long-winged form, Wharncliffe.
Conomelus limbatus Fall. Richmond.
Delphax discolor Boh. The long-winged form, Ecclesall Woods, Sheffield.
Rhinocola ericae Curt. Penn Hill. 65*.
Psyllopsis fraxini L. Keighley, R.B.
Psylla peregrina Forst. Keighley, R.B.; Witton Fell, Coverdale. 65*.
P. crataegi Schr. Witton Gell. 65*.
P. nigrita Zett. Keighley, R.B.; Carlton Beck. 65*.
Trioza urticæ L. Keighley, R.B.; Carlton Beck, Penn Hill, Kiveton Park.

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The Story of the Plants, by **Grant Allen**. London: Hodder & Stoughton, ix.+198 pp., 2/6 net. This is a new edition, in the People's Library Series, of one of Grant Allan's most popular scientific essays, and it is issued in the hope that it will appeal to a new generation if abridged, annotated and revised in the light of knowledge undreamt of by the author, who, in his desire to appeal to the imagination of the reader, and at the same time to avoid the use of scientific terms, often used phrases which gave false impressions. The necessary revision and annotation has been done sympathetically by Mr. Marcus Woodward, and in this form the book will appeal to many who desire a knowledge of plants presented in simple and attractive language. A short biography adds interest to the volume.

Principles of Plant Growth, by **Wilfred W. Robbins**. London: Chapman & Hall, 1927, vi.+299 pp., 11/- net. This book is written in simple, direct, non-technical language and attempts to answer questions commonly asked by farmers and other plant growers. It is also intended to serve as an elementary text-book in high schools in America. To this end the author, after a very brief introduction on the structure of the plant body, deals with the functions of the several organs, and the conditions under which they work. Some of the descriptions are too brief to be clear, and may be misleading, as the several references to bark as including all the tissues outside the cambium; he uses the term vascular ray for our more familiar medullary ray, and in describing lenticels refers to a figure of a stomate. As usual in American books, local names are often given without the scientific name, and are thus not easy to follow by other readers. Nevertheless the book is a very clear presentation of the more important principles affecting plant growth, cultivation and cropping, and will be welcomed by the type of practical student for whom it is intended. There are 136 clear illustrations, many from photographs. The concluding chapters deal very briefly with fungi, algae, mosses, ferns, club-mosses and gymnosperus.

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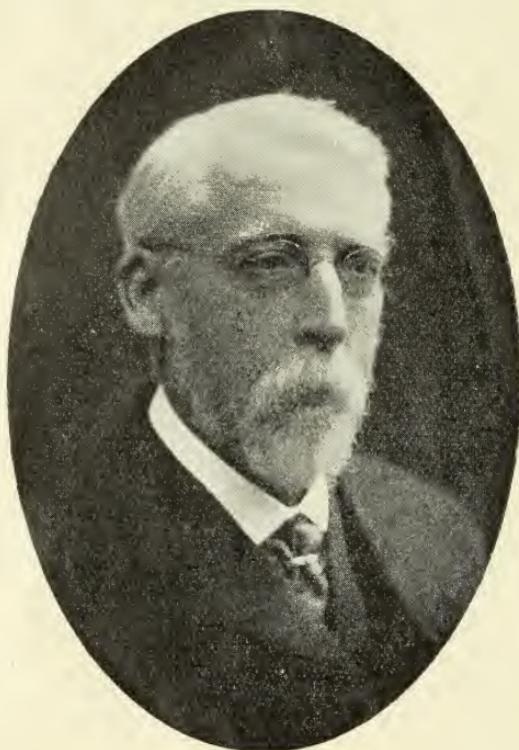
The Bowes Museum, Barnard Castle, has issued the Report of the Curator for the six years 1921-1927, in which he describes the more important additions to the collection, the way in which they have been re-arranged, the fact that some of the pictures have been withdrawn, etc.

In Memoriam.

GODFREY BINGLEY.

1842-1927.

MANY of those who took part in the delightful geological excursions in Yorkshire which were held in the 'nineties, will recollect that, with the present writer, they 'took turns' to carry an enormous camera, the property of Godfrey Bingley,



who was by no means a young man, but whose photographic work had then a world-wide reputation. Those were the days when the Annual Reports of the British Association Geological Photographs Committee, and the Yorkshire Geological Photographs Committee (the latter printed in *The Naturalist*) frequently contained more records of photographs taken by Mr. Bingley than by all the other contributors put together; and it was not only their quantity, but their quality was far above the average. Mr. Bingley's photographic knowledge, combined with an artistic eye, enabled him to secure geological photographs which were attractive, not only for their scientific value, but for their scenic effects.

So long ago as 1893, when my book, 'Geological Rambles in East Yorkshire,' was published, Mr. Bingley very kindly permitted me to select any photographs I required from his vast collection, and these he supplied entirely free of charge, as, indeed, he has on many subsequent occasions, for the illustration of geological and archaeological memoirs.

Some years ago, unfortunately, Mr. Bingley's eyesight failed him, but he did not let that interfere with his interest in geological and photographic work ; he still continued to attend meetings where he met his friends, until quite recently ; and though blind, he taught himself typewriting, thus keeping up correspondence with his colleagues.

His collections of photographic prints, negatives and lantern slides, containing several thousand examples, were handed to the Leeds University, where they are much appreciated. Mr. Bingley was a prominent member of the Yorkshire Naturalists' Union, Yorkshire Geological Society, Leeds Geological Association, and the Leeds Photographic Society, the last being one of the oldest of the kind in the country. He was the founder of the Yorkshire Photographic Union, and became its President, and when the Photographic Convention of England and Wales met in Leeds, he presided. Mr. Bingley was of a retiring disposition, and though his work was very extensive indeed, it was principally in the interests of his fellows. He published but little. He leaves two daughters, to whom we extend every sympathy.—T.S.

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WALTER BAGSHAW.

MR. WALTER BAGSHAW, a well-known Yorkshireman of high culture and many interests, died at Harrogate on April 26th, aged 75. He was born at Dewsbury, and lived most of his life at Batley, where he held a prominent position in business, educational, and civic affairs.

The public work for which he was best known was in connection with the Museum at Batley, of which he was the founder. This Museum is a remarkable institution for a town of the size and type of Batley, and Mr. Bagshaw devoted himself with intense interest, enthusiasm, and generosity to its creation and prosperity. His public services were recognised in 1919 by his election as an honorary freeman of the borough.

Mr. Bagshaw was an amateur artist of ability, a lover of books, a naturalist, a racily interesting lecturer, a skilled amateur carpenter, inventor of a considerable number of mechanical appliances, and a worker and inventor in microscopy of much distinction.

Mr. Bagshaw's wife died five weeks ago. He leaves a son and a daughter.—(*From "The Yorkshire Post."*)

REVIEWS AND BOOK NOTICES.

NEW BOOKS ON TRAVEL.

In recent years a tremendous impetus has been given to books relating to travel, and to the fauna, flora, geology, or antiquities of far distant countries. To some extent this interest may have been fostered by the cinemas and lectures to 'philosophical' and other societies. Several excellent volumes of the character referred to have been recently issued. Messrs. Witherby continue to print their readable accounts of the people and fauna of different parts of the world, and **Major C. M. Enriquez's** volume, **Kinabalu**, is the latest to be added to this series (xx.+199 pp., 10/6). He deals with British North Borneo, a particularly fascinating area, and reproduces numerous photographs of butterflies and moths, the natives, landscapes, and the vegetation of the area dealt with. The author informs us that 'The country, as far as is known, has few metals, and has never had a mining tradition. It is essentially agricultural. It possesses valuable forests; rich, fertile uplands, and a comfortable climate. Rubber (first planted in 1893) has had a successful history. There can be no doubt but that British North Borneo has a future before it. But, as in the beginning, so now—it needs money and men. The population is only 357,000, or about ten to the square mile.'

From the same house appears **Islands Near the Sun**, by **Evelyn Cheesman** (236 pp., 12/6). This deals with Tahiti, Coiba, Gorgona and Cocos Islands. The illustrations indicate the curious and primitive homes of the inhabitants; the landscapes, curious vegetal features, coral islands, and so on. The author explains that the trip was not without its difficulties: 'Whenever I had definite objectives in view, then I found the native guides more a hindrance than a help. They are both lazy and obstinate; they can take you over their own trails, but will not even visualize a new trail leading to some point which is not productive of fei or wild pigs. Therefore they will announce that it is impossible to reach that point and make no attempt to do so. By far the wisest plan when collecting in areas beyond cultivation is to take a native guide to follow any trail likely to attain or approach that area; but then, if the trail does not touch it, to dismiss the native and cut a new trail. And in ninety-nine cases per cent. it will be found that the project is not an impossibility.'

From Messrs. Duckworth we have received **Ancient Cities and Modern Tribes**, by **Thomas Gann** (256 pp., 21/-). Here we are introduced to Jamaica and Maya civilisation, where the author shows us the extraordinary carved images, ancient temples and other relics of early and prehistoric tribes; their votive offerings, their altars and temples, and elaborate carvings on their Stela, with reproductions of the writings, one of which is said to have a record of the date corresponding to September 26th, 333. Antiquities are not his only theme; he refers to giant saw-fish, alligators, and other more or less rare members of the fauna; to chewing gum, evidence of cannibalism, locusts, tiger soup, caves, and, in fact, to an extraordinary variety of topics.

NEW TEXT BOOKS.

The Elements of General Zoology, by **William J. Dakin** (London: Oxford University Press, xvi.+496 pp., 12/6). There are an extraordinary number of ways in which zoological science can be approached. In the present instance the Professor of Zoology in the University of Liverpool, Dr. W. J. Dakin, gives a guide to the study of Animal Biology, correlating function and structure, with notes on Practical Exercises. In this respect he approaches the subject from a rather different standpoint from the usual one; and certainly the numerous experiments he

describes have much more interest than the familiar bare descriptions of physiological facts. There are over 250 illustrations, most of particular value to the practical zoologist, not the least interesting being his instructions for laboratory work. We can thoroughly recommend Dr. Dakin's book to students of zoology.

The Principles of Petrology, by G. W. Tyrrell (London : Methuen & Co., xii. + 349 pp., 10/-). The study of the rocks is an old one, but recent years have brought forward many new methods. These are described in detail in Dr. Tyrrell's new book, which is written for the serious student of the science. The author acknowledges his indebtedness to Doctors A. Harker, A. Holmes and others. He deals with Forms and Structure of Igneous Rocks ; Composition and Constitution of Magmas, Formation of Igneous Rocks ; Textures and Microstructures ; Classification ; The Distribution of Igneous Rocks in Space and Time ; Their Origin ; Sedimentary Rocks : Mineralogical, Textural and Structural Characters ; Deposits of Chemical Origin, and many other allied subjects.

The Divining Rod, by William Barrett and T. Besterman (London : Methuen and Co., xxiii. + 336 pp., 18/-). As we have endeavoured to indicate in these pages, time after time, we look upon the Divining Rod and its alleged properties of finding water, gold, or even criminals, as a relic of mediævalism, on a par with witchcraft. During the past quarter of a century we have made many references to the absurdity of those who contend that it is possible to detect hidden treasures by the aid of a bent twig. Like 'luck,' and 'fate,' and other things, however, the Divining Rod still has its devotees, and probably the greatest of these was the late Sir William Barrett, F.R.S., who spent many years in gathering together evidence in favour of the Divining Rod and its powers. Unfortunately he died before the completion of his work, and it has been carried on by Mr. Besterman. We gather that in his efforts to accumulate evidence, Sir William wrote between six and seven thousand letters, and he examined a similarly large number of volumes of all kinds. Mr. Besterman states : 'Whether the results justified this labour it is for the reader to decide.' So far as we are concerned, we are not converted. Unquestionably the volume contains a wonderful record of early references to 'Dowsing,' early illustrations taken from all manner of works on the subject (some going back to quite early times, one of which, dated 1704, shows the dowser unmasked, from which it is clear that in that particular writer's opinion the dowser is the devil !) While students of old-time traditions will welcome this book as a record of the tremendous hold dowsing once had upon the credulity of the populace, we still think that a person with a geological knowledge of a district is the one most likely to give reliable information as to the water supply, or minerals, to be found in that area. The criminals may be left to the police !

Animal Mind, by Frances Pitt (London : G. Allen & Unwin, Ltd., 340 pp., 15/- net). Few people have taken more advantage of the opportunities they have had in gathering evidence of the intelligence, forms and personality of animals than has Miss Frances Pitt, whose work is well known to our readers. The present volume is a summary of her observations on various wild animals, in which she deals with such subjects as Fun and Mischief, Revenge, Rage, Destruction of Young by the Mother, Instinct, Migration, The Homing Instinct, The Broken-wing Trick, Territory, The Storing Habit, Nest Building, The Mind of the Hunter, etc.

One Touch of Nature, by F. W. Tickner (London : University of London Press, viii. + 187 pp., 2/6). This little book contains a series of essays on Gilbert White, Henri Fabre, Richard Jefferies, W. H. Hudson, W. W. Fowler and Edward Thomas, and forms a welcome account of the work of these great field naturalists.

The Origin of Continents and Oceans, by **Alfred Wegener** (London : Methuen and Co., xx.+212 pp., 10/6). In recent years the scientific world has been much concerned with the researches of Wegener, which have resulted in many usually accepted ideas relating to the earth and its origin having to be reviewed. Hitherto it has been exceedingly difficult for British readers to form a reasonable idea of the nature of Wegener's various theories, even so-called popular lectures on the subject frequently failing to be convincing. In the present work J. G. A. Skerl has translated the third German edition, and Dr. J. W. Evans, F.R.S., Past-President of the Geological Society of London, gives a useful introduction. Numerous maps and diagrams help to make this book understandable.

—:o:—

The British Museum (Natural History) has issued a **Catalogue of the Type Specimens of Lepidoptera Rhopalocera in the British Museum, Part III., Nymphalidae**, by **A. G. Gabriel** (128 pp., 7/6). This is a list, pure and simple, but is none the less of value to specialists.

An Outline of Plant Geography, by **Douglas H. Campbell**. London : Macmillan, 1926, ix.+392 pp., 17/- net. Professor Campbell is well known to students of botany by his excellent studies of mosses and ferns, in the structure and development of which he is an acknowledged authority. In the present work he has left his favourite track and ventured into a new field. Though not a plant geographer or systematist, Professor Campbell has seen many types of vegetation in various parts of the world; and notes, sketches and photographs there obtained, form the basis of this volume. The task of dealing with the vegetation of the world in less than 400 pages is not an easy one, and admittedly only a sketch has been possible. This, however, has been done in a simple, readable style, and the value of the work is greatly enhanced by 101 illustrations from photographs and fifty-two plates, which give the reader an excellent idea of the region dealt with. In nine chapters, the author deals with plants in geological time, factors in plant distribution, climatic zones, the north temperate zone, palaeotropics, neotropical regions, and the south temperate zone. The aim of the author has been to make the work sufficiently detailed to be useful as a book of reference to botanists and for students studying plant geography. From the latter point of view the work is not very successful, and lacks that care in detail and expression which is so much desired in a modern work on plant geography. This appears to be due to too much reliance on the older school of plant geographers and too little appreciation of recent work which has done so much to extend our knowledge since the days of Hooker, Drude and Schimper, hence the result scarcely warrants the view expressed in the preface that 'It is conceivable that one who is, in a way, an amateur may be more likely to appreciate the more salient features of a flora than the specialist in some particular group of such a flora.' This is shown clearly, for example, in his account of the conditions and flora of the arctic and sub-arctic regions, and students will need to correct and extend this by reference to the works of Simmons, Kjellman, Ostenfeld, Fernald, and others. That he includes *Empetrum* in the heath family is perhaps only a slip. Notwithstanding these defects the book will be found useful, and the publishers have done their work with characteristic excellence.

—:o:—

Messrs. E. Percival and H. Whitehead favour us with a copy of their paper on the 'Biology of the Mayfly, *Ephemera danica* Mull.', which has appeared in *The Proceedings of the Leeds Philosophical Society*.

From the *Bulletin de la Societe Zoologique de France*, Mr. Hans Schlesch sends us a reprint of a paper of his on 'La Distribution de *Lauria cylindracea* da Costa=*umbilicata* Draparnaud, dans L'Allemagne du nord et La Scandinavie.'

NEWS FROM THE MAGAZINES.

Jenkin Griffiths has an illustrated article on 'Darley Dale Quarries (Derbyshire)' in *The Quarry* for April.

Dr. J. Davidson writes on 'The Biological and Geological Aspect of Migration in Aphides' in *Science Progress* for April.

Mr. R. Lloyd Praeger writes on the 'Eider Down' and Mr. D. Clouston on the 'Longevity of Seeds,' in *The Irish Naturalists' Journal* for March.

The varying opinions on the harm done by rooks to crops by Dr. W. E. Collinge and Mr. Riley Fortune, are cited in the Spring Number of *Bird Notes and News*.

The Entomologist for April contains a photograph of the members of The Entomological Club, with Mr. G. T. Porritt in the chair, and also an appreciation of the work of our late colleague.

From the *Journal de Conchyliologie* Mr. Hans Schlesch sends the following reprints: *Vertigo lilljeborgi* Westerlund et autres Vertiginidæ Arctiques-Alpins; and Notes sur la Distribution du *Volutopsis norwegica* Chemn et du *Beringus turtoni* Bean.

The Journal of Conchology for March includes a note on 'Fossil Marine Shells by the Roadside.' These apparently occurred in a bed of sandy gravel, and consisted of the mussel, periwinkle, and Patella. Personally we are doubtful about the correctness of the use of the word 'fossil.'

In the 'Fifth Report of the Committee on the Nomenclature and Records of Occurrences of Rare Birds in the British Islands and Certain Necessary Changes in the Nomenclature of the B.O.U. List of British Birds,' printed in *The Ibis* for April, we notice the following 'minor correction'—**Asio otus otus** (Linnæus), not *Asio otus otus* Linnæus.

In *The Ibis* for April, Dr. W. E. Collinge gives 'Some Remarks upon the Insect Food of the Black-headed Gull.' He examined the contents of 644 stomachs, among which sixty-one species of insects were identified. 'The consumption of wireworms and daddy-long-legs is prodigious, and, if for no other reason, this alone should entitle this species to protection.'

In *The Avicultural Magazine* for March is a plate containing 'The Oldest Bird Painting in the World. The age is early IV. Dyn., say 3000 years B.C. Found in a chamber tomb at Medum on the Nile, where it formed part of the wall decorations. The birds depicted are, from left to right: *Anser cinereus* (Meyer), *Anser albifrons* (Scopoli), *Branta ruficollis* (Pallas).'

In *The Vascular* for April, Kathleen B. Blackburn writes on 'Vivipary in Flowering Plants'; J. E. Hull tells us about 'Ad Murum'; J. H. Smyth writes on 'Dopplerite—in Durham'; J. E. Ruxton on 'Hymenoptera aculeata in the Derwent Valley'; and J. W. H. Harrison on 'Melanism and Melanochroism in Lepidoptera.' The Sunday opening of the Hancock Museum seems to have been successful, as it has been in other museums for ages past. A writer on 'An Expedition' is distinctly a humorist.

In *The Medical Herbalist* for May, Andrew Allan (Student), in an article on 'Common Plants and their uses,' writes the following in reference to Agrimony:—'This is a common plant all over England, and is found growing in the hedgerows, pastures and wood-sides. Its leaves are long, dented at the edges, hairy underneath, and greyish and green above. The stem is brown, hairy, round and strong, and grows to about two or three feet high, with smaller leaves at the top. It grows small yellow flowers, one above another in long spikes. The root is black and long. It is perennial, and flowers about July or August. The diseases in which its employment is indicated are biliousness, sickness, vomiting before or after meals, swelling after meals, dropsy, gravel, sick headache, waterbrash, diabetes, and general debility.'

NORTHERN NEWS.

A second edition of Dr. F. J. North's admirable guide to 'The Slates of Wales' has already been called for, and contains much additional matter. (National Museum of Wales, Cardiff, 84 pp., plates, 6d.)

John H. Davies has notes on the 'Classification of the Carboniferous System' in the *Colliery Guardian* for April 22nd, in which he gives a vertical section and chart for the mollusca in the South Wales beds.

The Annual Report and Transactions of the Manchester Microscopical Society for 1925, recently received, contains Dr. J. Stuart Thomson's Presidential Address on 'The Auditory and Static Organs of Animals,' and a remarkable series of Photomicrographs of *Hydra*, with descriptions by A. E. Openshaw.

It only seems like a few weeks ago that the present writer gave an address at the inaugural meeting of the Worthing Archaeological Society : and before us we have the Fifth Annual Report of the Worthing Archaeological Society, which now has a membership of 245. The Report includes a record of 'Hightown,' by C. H. Goodman ; 'Suggestions for a Photographic Survey and Record.'

'The Churchwardens' Accounts of Quainton,' are described in *The Records of Buckinghamshire* recently published. Payments for Hedgehogs (spelt hedghaks, hedgehakes, etc.) began in 1675, at 4d. each ; for a 'Polkat' 2d. was paid ; since 1672 foxes realised 1/- each, and in 1685 a badger realized 1/-. By 1709 moles were included in the list of vermin, and 2d. each was paid for them, and in 1711, 3d. a dozen was paid for sparrows. In 1733, 9 foxes, 63 hedgehogs, and 130½ dozen sparrows were paid for.

The annual meeting of the Darlington and Teesdale Naturalists' Field Club was held on April 26th. Mr. Joseph Bowker was appointed President for the coming year. Mr. John E. Nowers, Secretary, said that the activity of the two previous years had been well kept up. The club had sustained a loss in the death of Dr. S. G. Mostyn, who was killed in Scotland on 22nd June. The average attendance at the excursions showed an increase, and had averaged 27. The Grammar School Natural History Society has been affiliated with the club, a combination which should be of considerable help in bringing young workers forward. During the year 43 new members had been elected to the club, including 11 juniors. The total membership now stood at about 190. The Treasurer (Mr. R. H. Sargent) said that the big decrease in the balance in hand was accounted for by repairs and renovations. The balance sheet showed a balance in hand of £1 11s. od. The balance brought forward from the preceding year was £15 4s. 4d. Mr. J. E. Nowers exhibited an antique spear-head which had been discovered near the Haughton Road Railway Bridge. It was decided to dispense with a sectional organiser for geology. The other organisers were re-elected. Mr. R. H. Sargent was re-elected Hon. Treasurer, and Mr. J. E. Nowers Hon. Secretary, and Miss Nowers as Hon. Assistant Secretary.

A writer in a southern archaeological journal, whose accuracy we should be the last to doubt, states :—'I have seen in Slindon churchyard an epitaph dated 1789, and I think that the fine spirit of optimism which pervades it makes it worthy of reproduction—

"Here lies a poor woman who always was tired,
Who lived in a house where help was not hired.
Her last words on earth :—' Dear friends, I am going,
Where washing ain't done, nor sweeping, nor sewing,
But everything there is exact to my wishes,
For where they don't eat there's no washing of dishes ;
I'll be where loud anthems will always be ringing,
But, having no voice, I'll get clear of the singing.
Don't mourn for me now, don't mourn for me never,
I'm going to do nothing for ever and ever."

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BIRDS OF MARSH AND MERE.

A volume entitled 'Birds of Marsh and Mere, and how to Shoot them,' by J. C. M. Nichols,* is clearly the work of a wild-fowler, rather than that of a person interested in bird sanctuaries. The species dealt with are Geese, Ducks and Waders, and are those appealing to the wild-fowler. There are chapters on various methods of wild-fowling, and illustrations showing the characteristics of the birds and their flight. The frontispiece is a coloured representation of a White-fronted Goose, and is a very fine piece of work. This we are permitted to reproduce, and will give an idea of the type of illustration.

LIVERPOOL SCIENTIFIC SOCIETIES.

A pamphlet, which must be very useful indeed to the scientific men of Liverpool, has been issued with the title 'The Associated Learned Societies of Liverpool and District. Constitution, Committee, Activities and Calendar' (32 pp.). It is issued by the Joint Committee of Learned Societies of Liverpool and District, of which Mr. W. Mansbridge is the Chairman, and Miss Ethel Warhurst the Hon. Secretary. There are particulars of the various scientific societies in Liverpool, with brief notes on their history, lists of officers, and an outline calendar for 1926-7 is given, in which the whole of the meetings of these societies are set out so that one can see day after day which meetings are being held. We think a similar pamphlet giving particulars of the various meetings and excursions of the Yorkshire Scientific Societies might be useful, even if confined to those affiliated with the Yorkshire Naturalists Union.

WEST'S ALGA FLORA.

It is a compliment to the two Yorkshire workers, W. West and G. S. West, father and son, that a new and revised edition of 'A Treatise on the British Freshwater Algae,' by G. S. West, which originally appeared in 1904, has been called for.† The older members of the Yorkshire Naturalists' Union will remember the enthusiasm of the father, and the way in which the difficult study of Algae was also taken up by the son, G. S. West, who became Professor of Botany at the University of Birmingham. Since then a whole army of students has been following up the work which they accomplished, and the present volume has been revised and a great part re-written by Dr. F. E. Fritsch, Professor of Botany in the University of London. It is now extended to over 500 pages, is well illustrated, and certainly is the standard work on the subject.

* London : A. M. Philpot (287 pp., 15/-).

† London : Cambridge University Press, xviii.+534 pp., 21/- net.

AN EXPEDITION.

In *The Vasculum* for April an anonymous writer describes 'An Expedition.' He says :—' Four conspirators duly met on Friday, March 11th, under the most dismal of conditions, as befitted the darkness of their deeds. First rolled up the Captain, dressed to defy the elements, carrying a brand new acetylene lantern and a large flat tobacco tin, perforated, both top and bottom, with a mystic pattern. Next followed the Professor, clad in rags dug out of some prehistoric store of second-hand clothing, with boots to match, likewise clutching tightly a lantern and a mysterious vessel, neatly fitted with perforated discs and a curiously arranged cork. However, of him all suspicions disappeared when the perforations became visible ; despite his woebegone appearance, the tin was not a flask, and all his breath smelt of was chocolate cream ! Soon Miana literosa, stepping briskly forward, produced his equipment, an electric lantern weighing approximately 6.538 tons (the accuracy of the last figure is not guaranteed), and a box, looking like a hybrid between a concertina and a folding camera, back crossed on a chocolate box ; it also bore the curious cork arrangement ornamenting (?) the Professor's impedimenta. Finally, the Expert, shouldering aside the raindrops as he progressed, pushed his way forward and placed himself at the head.

'SLAUGHTERING "PAINTED LADIES."'

'Muttering wild words about 15 years ago, 25 years ago and even (let it be whispered) 40 years ago, and thrusting in front of them their weird collection of instruments, they scared the conductor of an adjacent bus sufficiently far away from the door to allow them to enter. Here, ruthlessly casting all other intruders aside, and making themselves a general nuisance, they began to talk of the dark deeds of their remote past, putting their fellow passengers into a thoroughly shivery condition. The Expert talked of slaughtering "Old Ladies" and "Painted Ladies," the Captain turns on reminiscences of his desperate deeds at Wylam, the Professor launched forth torrents of some uncouth foreign language, whilst Miana literosa simply gasped as if stunned, clinging pathetically all the while to his box of bombs. In the end, so horrified were the driver, conductor and passengers, that they stopped the bus at the "pub" at Winlaton Mill and hurled the noble four forth into the miseries of the night.'

A NORTHERN PROTEST.

Under the above heading, in *The Entomologist's Monthly Magazine* for May, Mr. G. B. Walsh follows up the strong protest made by Mr. E. G. Bayford so long ago as 1913 (see *The Naturalist* for that year, pp. 255-257), against writers

ignoring records published in several natural history journals of repute. Time after time a species is said to occur only at one or two—generally southern—localities, when several northern records have appeared in *The Naturalist* or other journals. Certainly the authors in question know of the existence of these journals, but apparently have not taken the trouble to examine the records. We recently had submitted to us what professed to be a complete list of the occurrences of a certain form of animal life in Yorkshire, which not only omitted several species recorded in recent volumes of *The Naturalist*, but some of these had been printed on the authority of the author himself, after he had examined the specimens! As he made the somewhat unusual condition that the list be printed precisely as sent and without any alteration, it was returned, and he forgot to thank us for drawing attention to some of the numerous omissions he had made!

PROCESSIONAL CATERPILLARS.

We extract the following from *The Entomologist's Record* for May:—‘The *Evening News* in its issue of February 12th, describes an amusing experiment played upon the Colony of these insects at the Zoological Gardens, which is perhaps worth recording in a less ephemeral journal. On the occasion of one of their periodical route marches the experiment was made of linking up the head of the procession to the tail by means of the guiding silk thread laid by the leader, with the result that, although the leading caterpillar may have been somewhat surprised at finding himself unexpectedly at the rear of his column, he did not hesitate, but loyally followed on, and so the caterpillars solemnly tramped round and round for a day-and-a-half. When tired they are stated to have simply curled up where they were, and on waking to have resumed their rotatory peregrination, and that though food was plentiful, apparently they ignored it. The end of this rotatory walk would obviously have proved disastrous had not one caterpillar fallen out from exhaustion, and in his fall carried away some of the guiding thread, with the result that, before he could resume his place, he had automatically become the leader, and the rest following loyally after him down the thread, the vicious circle was broken. The writer pathetically adds how happy certain Politicians would be if only their followers were as faithful !’

JAWS AND TEETH.*

Students of prehistoric anatomy, and especially the constantly increasing number interested in early human remains,

* ‘Variations in the Form of the Jaws,’ by J. Sim Wallace. London : Bailliere, Tindall & Cox, xii.+265 pp., 17/6 net.

must have been struck by the enormous variation in the teeth in early skulls, or even in skulls of modern civilized races, compared with those of more highly civilized peoples. Present methods of living, elaborate systems of cooking, and artificial foods of all descriptions, together with soft foods, sweets, and so on, have done much to interfere with the natural growth of teeth, particularly in young people who do not use the teeth in the way their ancestors did. As a consequence, numerous malformations and diseases occur, and in many cases, by careful attention in early years, what would unquestionably have resulted in an ugly series of protruding teeth, have been so dealt with as to appear more or less normal. It is truly remarkable what tremendous improvements have been affected generally in the appearance of people (quite apart from the obvious advantages from a health point of view), as a result of the examination of teeth, and attention thereto, in young people. In this way the school clinics more than justify their existence, quite apart from their many other activities. We have been led to make these remarks from a perusal of the magnificent volume prepared by Dr. Wallace, of Harley Street, London, whose 'Cartwright Prize Essay, 1920-1925,' now appears in this well illustrated and well printed form.

A YORK PUZZLE.

'Antiquary,' in a Yorkshire paper recently, wrote:—
 'Mr. Linfoot has recently found in the drift sand at Acomb a large leg bone of enormous antiquity. The bone, which he has presented to the Yorkshire Philosophical Society, has been submitted to experts on ancient anatomy, including the British Museum expert, who says he has never seen a bone like it; neither can it be associated with any classified specimens. He cannot say if it is of mammal, reptile or bird origin, but it would appear to belong to the bird section, for it does not seem to have belonged to anything having a knee cap. The peculiar extended formation at the foot end of the bone suggests some creature with a wide, spreading foot. If a bird it must have been of huge proportions. It is said to be of the Tertiary period.' It is perhaps unfortunate that there are no Tertiary deposits in Yorkshire, and, frankly, we don't believe that 'the British Museum expert' would make any such silly statement.

THE EXPERTS AGAIN.

Since writing the above I have seen the head of the Department at the British Museum who, ordinarily, would have a bone submitted for identification, and, as expected, he knew nothing of the matter, and no such bone had been submitted to him. In these circumstances it is difficult to

understand the statements made by 'Antiquary.' Of course, if the bone was submitted to the Department of Ceramics, or Coins, we could understand the 'bone' (if indeed it is a bone) being unknown. But surely he should not be described as 'the British Museum expert.' It is not so long since that a well-known daily paper reproduced a photograph of a jaw of a cart-horse, which we were told was the jaw of an animal unknown to the authorities at the British Museum. The bone had apparently been shown to one of the staff of the British Museum, who certainly knew nothing of bones or horses. But he might have referred the matter to the correct Department, instead of 'telling the world' that the British Museum knew not a cart-horse.

FLINT FRACTURES.

In *Nature* recently a writer states : 'During the course of my work in the experimental fracture of flint by (a) human blows delivered by a hammer-stone, (b) unguided percussion, (c) unguided pressure, and (d) the application of heat, it became, in my opinion, possible, by a close examination of an extensive series of each of the differing types of flaking produced by these various methods of fracture, to differentiate between the work of man and that of Nature.' He then gives photo-micrographs of flints fractured by human blows and by thermal agency respectively, which are very similar, the grains of one being smaller than the other (possibly due to the texture of the flint), and then goes on to say : 'I conceive that differences, though less easily observable, may exist between the surfaces of flints fractured by human blows and natural pressure, but so far I have not been able to establish this very important fact to my satisfaction. I believe, however, that this method of attempting to ascertain the manner in which a flint has been broken, though novel, has great possibilities before it, and will lead to very definite and valuable scientific results.' Possibly.

AN ARTESIAN BOREHOLE.

Among the many valuable contributions appearing in *The Transactions of the Institution of Water Engineers*, Vol. XXXI., just issued, is a paper by E. J. Silcock on 'The History of an Artesian Borehole.' In this he gives an account of the difficulties which had to be encountered in the construction of the Borehole at Oswaldkirk, and his paper is illustrated by diagrams and plans. He goes on to say : 'It was thought that as there must be a considerable volume of water rising, material might be introduced that would lodge and swell in the place. Dried peas have been employed in some operations, but it was feared that they would be too small to be

arrested in the passage, and Horse-beans were chosen. A sack of beans was accordingly thrown down the bore, and whether the hypothesis was sound or not the fact remains that the pressure was restored within ten minutes of the application, and was maintained for many months, presumably until a new passage had been eroded or the beans washed away. The problem to be faced, therefore, was how to make a fresh joint between Kellaways Rock and the bore tubes. The difficulty of doing this arose from the great water pressure which had to be contended with the high velocity of the water passing up the back of the bore tube which would wash away any cement grout which might be injected.'

SALE OF STONE IMPLEMENTS.

Commenting on the sale by auction of an extensive collection of stone implements from Suffolk recently, *Nature* says : 'this sale has shown that these stony and enduring records of early but barbaric man are very far behind the ephemeral postage stamps of his civilised successors in the public estimation. No single implement fetched more than £3. Close on two hundred and fifty lots, comprising 6000 "flints," passed under the hammer for a total of £293 9s. In detail, 287 palaeoliths brought £25 4s., and 1076 neoliths, mostly from the eastern counties of England and the Thames Valley, brought £103 17s., an average of 10 to a £1. Those from the South Downs, with others, were sold at about thirty to a £1, and some 300 from abroad only fetched £15 1s. For years we have been stimulated by the sight of long series of such specimens beautifully set out in museums in expensive cases, to wander across ploughed fields and gravel heaps looking in vain for flints that never turned up, but which we had come to regard as of great value. Can it be that the reward for finding them is so small as the Hewlett sale would lead us to suppose? If so, flint-collecting is certainly an appropriate hobby for a poor man of science.'

THE STONES OF LONDON.

Mr. J. Allen Howe recently lectured to the Royal Institution on the above subject, and stated : 'Situated on a sub-stratum of clay and incoherent gravel, London, from its very beginnings, has had to go beyond its borders for stone. In the fragments of the Roman Wall we have evidence that its builders sought the slopes of Hertfordshire for boulders of hard sarsen stone, the Downs and the Weald of Kent for chalk, ragstone, chert, and firestone ; while the local flint gravel was freely used then as now. The Normans introduced the stone from Caen, of which examples may be seen in the Tower, Westminster Abbey, and other buildings. Beer

stone from Devon and the somewhat similar Clunch stone, both from the Chalk formation, were much in demand for carving from about the eleventh century ; while for columns, beautifully exemplified in the Temple Church, the marble of Purbeck was the favourite material. From the Great Fire of 1666 a new stone era began for London ; although many other stones have been and still are employed, Portland stone from that time began to play a dominant part. The majority of London's buildings are now built or faced with limestone, which is readily attacked by the acid-laden town atmosphere, yielding calcium sulphate in the process ; this is in itself a cause of further destruction, as the solution soaks into the stone and there crystallises.'

LEAD MINING IN YORKSHIRE.

At a meeting of the Newcomen Society, on March 30th, a paper on ' Lead Mining and Smelting in West Yorkshire ' was read by Dr. A. Raistrick. In the course of his paper, Dr. Raistrick traced the history of lead mining in the Yorkshire dales from Roman times down to the present day, giving notes on the method of quarrying the ore, smelting it, and its sale and transport. Lead pigs are in existence bearing the names of Roman emperors, and there is evidence to show that the industry was carried on continuously, practically down to the present time, though to-day little is being done. The cheaper ores from Spain and elsewhere have been the main cause of the decline, but as foreign mines have to go deeper and instal more machinery, the ore will increase in price and thus the Yorkshire mines may again become profitable. The paper contained much of interest to those who study the history of mining.

THE MUSEUMS ASSOCIATION AND MAN.

We learn from *The Journal of The Manx Museum* that 'The Annual Conference of the Museums Association is, by invitation of the Trustees of the Manx Museum, to be held this year in Douglas, when about 100 delegates are expected to arrive on Saturday, 2nd July, and stay till the following Saturday, 9th July. The members of this important body are the Directors, Curators and Committee-men of Museums in Great Britain and Ireland. Their meeting in the Isle of Man is a recognition that the Manx Museum is an example of the same class as those with which they are connected. Their experience and advice will be helpful and their visit should tend to increase the interest and the pride of the Manx people in their own Museum as a national institution growing in favour and in usefulness and proving to be an attraction both to our own people and to visitors to the Island.'

POEMS OF BONNIE SCOTLAND.*

Bobbie Burns is dead, but his soul goes marching on, though not in these verses. In 'Near Ellen's Isle' we learn

' A treble note sounds t'wards the west,
Whilst nearer on the east,
A vibrant chord from Nature's breast
Is shadowed by the mist.'

Then; with the odd title 'Guess where I slept last night,' we hear that

' I saw the Star of Hope last night
As I gazed at the sky above,
And I longed for you, my own dear Love,
And the smile on your face so bright.'

The author has been to Aberdeen? as we learn

' But 'tis in the granite northland,
By the northern gate ajar,
That my lovelit soul will linger,
Now that Aberdeen's awa'.'

The volume is dedicated by the lovelit soul 'To One who encourages and inspires.' That 'one' (whether a 'he, she, or it') reminds us of the Glasgow workman's 'aye button,' which 'had a deel o' responsibeelity.' The author has probably saved the life of the 'one' by keeping his, her or its name secret!

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According to the statistics given in the *Report of the Salford Museum and Art Galleries*, just to hand, it would seem that since the turnstiles have been installed the attendances at those institutions have dropped to about a quarter of what they were.

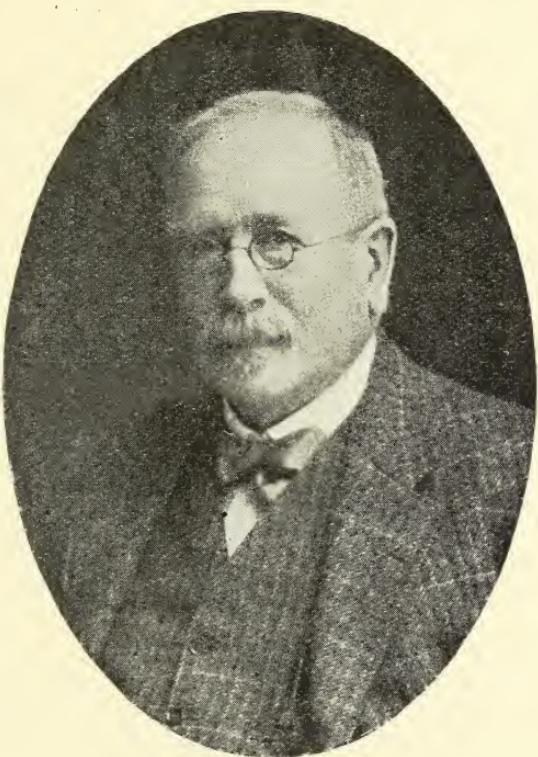
Among the contents of *The Annual Report and Proceedings of the South Western Naturalists' Union* are the Presidential Addresses of Dr. E. J. Allen on 'Regeneration and Reproduction of Syllids,' and of Dr. W. Watson on 'The Origin of Floral Leaves.'

No. 8 of *The Proceedings of the St. Peter's School [York] Scientific Society* contains summaries of the lectures delivered before the Society. The editor announces that 'greatest interest is attracted by the generous gift of the herbarium. Our heartiest thanks are due to Mr. H. J. Wilkinson for this gift, which is one of the most complete collections of British Flowering Plants in England.' Lists of local plants, etc., also occur.

The Annual Report of the Yorkshire Philosophical Society for 1926 contains summaries of papers read at its meetings, including 'Primitive Breeds of Sheep,' by J. S. Gayner; 'Irish Stone Drinking-cup,' by W. E. Collinge; 'History of the Drama in York in the Reigns of Elizabeth and James I.', by A. Raine; 'The Earliest Extant Commercial Treaty with an English Kingdom,' by J. S. Gayner; 'Technical Notes on the St. William Window in York Minster,' by J. A. Knowles; 'Work of the Geological Survey in Yorkshire,' by C. E. N. Bromehead; and 'The Excavations near the Multangular Tower,' by A. Raine.

THE LATE WALTER BAGSHAW, J.P.

Referring to the notes on the late Walter Bagshaw appearing in *The Naturalist* for May : Mr. Walter Bagshaw was an old and valued member of the Yorkshire Naturalists' Union, and although heart trouble had of late years prevented active work in the field, he always took a keen interest in its doings, and at one time regularly attended the winter meetings of the Vertebrate Section.



His main interest, however, was in the microscope, and especially in photo-micrography. His book upon this subject, for which three editions have been called, remains a standard work. He was ever ready to lecture and impart his knowledge in this direction to the veriest tyro. One most interesting demonstration which he frequently gave illustrated, in a very practical manner, how to pursue this fascinating branch of science for an outlay of one shilling. He was an inventor of many useful and valuable articles, and only a very short time ago invented a revolving microscopic lamp of great utility, which has recently been placed on the market by Messrs. Watson and Sons, High Holborn.

For quite a number of years he was on the lecture staff of

the Yorkshire Photographic Union and one of its most prolific lecturers and demonstrators. He was a good speaker and always in great demand, for he had a keen sense of humour, and his speeches simply sparkled with dry humour, generally keeping his audience in roars of laughter.

An artist of great ability, both in oils and water colours, it was only in February last that some of his pictures were accepted for exhibition in the Harrogate Art Gallery. His beautiful micro-photographs have been accepted for publication in most of the important magazines in this and other countries. His activities were great and varied, and he was wont to say that the days were much too short for him—one of forty-eight hours would not have been too long. Many beautiful articles of furniture and virtu, to be seen in his home, illustrated his marvellous skill as an amateur cabinet maker.

He was connected with many societies, both scientific and commercial, in all of which his fine character and honourable conduct was greatly esteemed. He had also a long and active municipal career, the worth of which was recognised by the authorities at Batley, presenting him with the freedom of the borough in 1911.

The founder and, until his death, he was the Hon. Curator of the Batley Museum, to which he devoted much time and money; one of his last acts was to pay a visit to it. A few years ago he presented a large and beautiful case illustrating sea bird life on the Yorkshire coast, the birds being shown on their natural cliffs. This was executed regardless of cost by that fine naturalist, William Farren, of Cambridge, and was given in memory of his brother.

In so many directions did Mr. Bagshaw's activities lead him, and so many and varied were his interests (and in all he excelled), that it is quite impossible to mention them all. His fine and unassuming character, his wonderful abilities and humourous sayings, will long be remembered by his many friends, who deeply regret his passing.—R.F.

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We learn from *The Yorkshire Post* of May 9th, under the head of 'Rare Bird in Lakeland,' that 'a pair of tufted ducks has been seen by a naturalist on a marsh in the Lake District. This is a rare bird, and the observer wisely declines to "localise" his find, as he fears the predations of egg collectors.'

On May 1st there died in Carlisle, George Dawson, a well-known naturalist of a past generation. He was in his 85th year. He began collecting butterflies when eight years of age. During his long life he amassed considerable collections of Lepidoptera and Birds. These he recently presented to the museum at Tullie House. He also published several papers on local butterflies and moths in the old *Transactions of the Cumberland Association for the Advancement of Science*.

YORKSHIRE NATURALISTS' UNION.

LIST OF MEMBERS.

The Members whose names are printed in italics are Permanent Members of the General Committee. The dates preceding names are those of election; Original Members, being those elected prior to 1883, are marked —. L.=Life Members; H.L.=Honorary Life Members; P.=Past-Presidents; E.=Members of Executive; C.=Chairmen or Secretaries of Committees; * =Members who do not receive *The Naturalist*.

- 1905 L. ACKROYD, J., West View, 101 Dark Lane, Batley.
 1919 ... ADAMSON, R. S., M.A., B.Sc., Botanical Department, University of Cape Town, South Africa.
 1926 ... ALLEN, FRED, Greenfield, near Oldham.
 1926 ... ALLEN, REV. M. YATE, M.A., Moss Vicarage, Doncaster.
 1921 ... ALLISON, MISS HARRIET EVELYN, B.Sc., Training College, Bingley.
 1923 ... ARCHIBALD, C. F., Rusland Hall, Ulverston, Lancs.
 1926 ... ARDILL, CLIFFORD, 2 Miles Hill Place, Stainbeck Lane, Chapeltown, Leeds.
 1909 ... ARMSTRONG, A. LESLIE, M.C., F.S.A. 14 Swaledale Road, Millhouses, Sheffield.
 1920 ... ASHWORTH, JOHN H., Walton Fold, Longridge, Preston, Lancs.
 1921 ... ASLETON, J. H., 'Newlands,' Todwick, near Sheffield.
 1910 ... ASSHETON, MRS. M. N., White Beams, Upper Hardres, Canterbury.
 1921 ... ASTLEY, CAPT. H., Carr Laund, Nelson, Lancs.
 1907 E. ATKINSON, J., 33 St. Michael's Road, Headingley, Leeds.
 1911 ... ATKINSON, MISS CONSTANCE, 3 Woodland Grove, Chapeltown Road, Leeds.

 1927 ... BAMFORD, WM., 70 Kent Road, Harrogate.
 1933 ... BARKER, R. H., May Lodge, Filey Road, Scarborough.
 1921 ... BARRINGER, LESLIE, 59 Upper Albert Road, Meersbrook, Sheffield.
 1889 ... Bayford, E. G., F.E.S., 38 Eldon Street, Barnsley.
 1913 E. BEANLAND, J., 12 St. Margaret's Road, Horton Road, Bradford.
 1924 ... BEAUMONT, A. G., 19 Castle Road, Sandal, Wakefield.
 1925 ... BEAVER, J. FOSTER, Sutton House, Bingley, Yorks.
 1925* ... BEAVER, MISS MURIEL FOSTER, Sutton House, Bingley, Yorks.
 1920 ... BEHRENS, HAROLD J., 'Moorside,' Ilkley.
 1920* ... BEHRENS, MRS. G. J., 'Moorside,' Ilkley.
 1924 ... BELBIN, H. L., Totley Rise, near Sheffield.
 1907 ... BELLERY, W., 21 Clifton Road, York.
 1922 ... BENNETT, W., Parker's Hotel, Upper Briggate, Leeds.
 1907 ... BEVAN, D. W., 32 Nansen Street, Scarborough.
 1922 ... BINNS, REV. CHAS., 7 Melrose Crescent, Withernsea.
 1919 ... BIRCH, WALTER G., Yew Court, Stockton Lane, York.
 1913 ... BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY, Secretary, Avebury House, 55 Newhall Street, Birmingham.
 1903 ... BISAT, G. B., 30 Nether Hall Road, Doncaster.
 1921 ... BLACKSHAW, J. TREMAYNE, Moorside, Hampton Road, Doncaster.
 1924 ... BLAKELEY, WM., Beechwood, Church Fenton, Yorks.
 1905 P.L. BOOTH, H. B., M.B.O.U., F.Z.S., 'Ryhill,' Ben Rhydding, Yorks.
 1894 ... BRADFORD PUBLIC FREE LIBRARY, Librarian, Darley Street, Bradford.
 1921 ... BRADLEY, A. E., 8 Shaftesbury Avenue, Roundhay, Leeds.
 1921 ... C. BRAMLEY, WILLIS GEORGE, Pallathorpe, Bolton Percy, York.
 1885 ... BRANSON, F. W., F.I.C., 13 Briggate, Leeds.
 1919 ... BRIGG, JOHN J., M.A., J.P., Kildwick Hall, Keighley.
 1927 ... BROMEHEAD, C. W., B.A., Geological Survey Office, 14a Parliament Street, York.
 1919 ... BROOK, J. H., Laurel Bank, Laurel Mount, Leeds.
 1925 ... BROOK, NORMAN, 'Maydale,' Honley, Huddersfield.
 1926 ... BROOME, F., 37 Ashburn Road, Stockport.
 1922 ... BROOME, H. C., Netherthorpe, Failsworth, Manchester.
 1927 L. BROTHERTON, COL. SIR E. A., BART., J.P., THE HALL, ROUNDHAY, LEEDS.
 1924 ... BROWN, F. J., M.A., The University, Leeds.
 1920 ... C. BROWN, JAMES MEIKLE, B.Sc., F.L.S., 176 Carter Knowle Road, Sheffield.
 1920 ... BROWNING, MISS D. M., B.Sc., 18 Hawkeswood Avenue, Hawkesworth Wood, Leeds.
 1925 ... BURNETT, J., Kirby Moorside, Yorks.
 1925* ... BURNETT, MRS. J., Kirby Moorside, Yorks.
 1910 E. BURNLEY, A. I., 69 Ramsey Street, Scarborough.
 1914 E.C. BURRELL, WM. HOLMES, F.L.S., Bracondale, Horsforth, Leeds.
 1891 ... BURTON, J. J., J.P., F.G.S., 'Roscroft,' Nunthorpe, R.S.O., Yorks.
 1921 ... BUTCHER, R. W., B.Sc., Fisheries Experiment Station, Arlesford, Hamps.
 — * ... BUTTERFIELD, J. E., B.Sc., Ormesby, 21 Dorville Road, Lee, London S.E.
 1918 ... BUTTERFIELD, REV. FRANK B., B.L., 110 Harlow Terrace, Harrogate.
 1909 ... BUTTERFIELD, ROSSE, F.E.S., The Museum, Keighley.
 1916 L. BYWATER, MATTHIAS, 64 Park Road, Lowmoor, Bradford.

 1927 ... CARLINE, G. R., F.R.G.S., F.R.A.T., Bankfield Museum, Halifax.

- 1891 L. CARPENTER, Hon. Mrs. B., 22 Grosvenor Road, Westminster, London.
 1903 ... *Car, Prof. J. W.*, M.A., F.L.S., University College, Nottingham.
 1904 ... CASTLE, THOMAS, Orchard Villa, Heckmondwike.
 1923 L. CATTLEY, Major ROBT., M.B., C.M., B.Sc., F.R.M.S., 43 Main Avenue, Heworth, York.
 1924 ... CHADDERTON, TOM, Shaw Hall, Bank Road, Greenfield, near Oldham.
 1907 ... CHADWICK MUSEUM, c/o The Curator, Bolton, Lancs.
 1891 L. CHAMPNEY, J. E., J.P., 27 Hans Place, London, S.W.
 1910 ... CHAPMAN, His Hon. Judge E. H., M.A., Lindum House, Lincoln.
 1910 ... CHEAVIN, H. S., F.R.M.S., Chemistry Department, Middlesex Hospital Medical School, Mortimer Street, London, W.
 1905 L.E.C. *Cheetham, Chris A.*, 'Wheatfield,' Old Farnley, Leeds.
 1924 ... CHERRY, Miss A., 'Grainholme,' West Bank, Ribblesden, Keighley.
 1924 ... CHILD, Miss G. V. P., B.Sc., 'Romulea,' Weetwood Lane, Leeds.
 1925 ... CHILMAN, K. G., St. Peter's School, York.
 1920 ... CHISLETT, RALPH, F.R.P.S., M.B.O.U., 'Larkspur,' Broom Crescent, Rotherham.
 — L. Clark, J. E., B.A., B.Sc., Aysgarth, Riddlesdown Road, Purley, Surrey.
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 1917 ... CLEGG, COLIN, A.M.I.C.E., F.G.S., Mere Hall, Bolster Stone, Sheffield.
 1906 L. CLOUGH, SAM, Steeton Hall, near Keighley.
 1927 ... COCKS, Miss ANNIE, B.Sc., 9 Falmouth Avenue, Bradford.
 1919 ... COCKSHAW, EDWARD, 65 Blacker Road, Birkby, Huddersfield.
 1908 ... COWLING, H., Dover Cottage, Silsden, Keighley.
 1921 ... CRESSWELL, LIONEL, J.P., 'The Hall,' Burley-in-Wharfedale.
 1903 E. CROFT, Prof. E. O., M.D., 12 North Hill Road, Headingley, Leeds.
 1915 ... CROSS, EDWARD R., 12 Filey Road, Scarborough.
 1896 ... CROWTHER, J. E., Portland Street, Elland.
 1921 ... CROWTHER, HENRY, F.R.M.S., F.Z.S., The Museum, Leeds.
 1894 ... CRUMP, W. B., M.A., 'Hawcroft,' Weetwood Lane, Far Headingley, Leeds
 1921 E. DALLMAN, A. A., F.C.S., 17 Mount Road, Higher Tranmere, Birkenhead.
 1896 P.H.L. DAWKINS, Sir W. B., M.A., F.R.S., Owen's College, Manchester.
 1926 ... DAWSON, Miss MABEL, B.Sc., 19 Leeds Old Road, Bradford.
 1903 L. DENT, Major J. W., Ribston Hall, Wetherby.
 1922 ... DIBB, HARRY, 12 Grange Avenue, Hirst Wood Road, Shipley.
 1924 ... DIBB, JAMES, Cravendon, Draughton, Skipton.
 1926 ... DIBB, JOHN RATHNALL, 'Barrule,' King George's Avenue, Chapel Allerton, Leeds.
 1922 ... DIXON, Miss ANNIE, M.Sc., F.L.S., F.R.M.S., 'Broadwater,' Coed-Mor Drive, Prestatyn.
 1926 ... DIXON, WM. LAW, Bent House, Littleborough, near Manchester.
 1926 ... DUFTY, FRAS. J. NORTH, 18 Brook Street, Skipton.
 1924 ... DUNCAN, J. B., 6 Summerhill Terrace, Berwick-on-Tweed.
 1923 ... DUNDAS, J. F., Dale Cottage, Cawthorne, Barnsley.
 1906 ... DWERRYHOUSE, A. R., D.Sc., F.G.S., 'Toots,' Darell Road, Caversham, Reading.
 1925 ... DYSON, C. W., 19 Portland Street, Huddersfield.
 1910 C. EDMONDSON, F. H., The Lindens, Utley, Keighley.
 1924 ... EDMONDSON, Miss FREDA, The Lindens, Utley, Keighley,
 1927 ... EDMONDSON, Miss C., West Cliffe, Keighley,
 1901 ... EDMONDSON, Prof. T. W., M.A., New York University, University Heights, New York, U.S.A.
 1904 ... EDWARDS, Canon J. R. WYNNE, M.A., The Vicarage, Kirklington, Yorks.
 1912 ... ELLIOTT, THOMAS, Beechville, Cambusbarron, Stirling.
 1893 ... ELMHIRST, C. E., 29 Mount Vale, York.
 1921 ... ELWERS, W., 1 Buckingham Road, Doncaster.
 1927 ... EUSTICE, Miss VIOLA, B.Sc., 30 Lea Street, Lindley, Huddersfield.
 1922 ... EVANS, Capt. S. E., M.A., 32 Thorne Road, Doncaster.
 1909 P. FALCONER, W., F.E.S., 12 King Street, Waterloo, Liverpool.
 1922 ... FAWCETT, C. B., B.Litt., M.Sc., The University Leeds.
 1921 ... FEARNSLEY, W. F., Shawcliffe House, Westgate, Otley.
 1925 ... FEATHERSTONE, C. R., M.A. (Oxon.), Clifton Rise, York.
 1920 ... FERRALL, EDWARD L., Bank House, Penistone.
 1892 ... FIERKE, F. W., 86 Grafton Street, Hull.
 1920 ... FIRTH, HARRY, 45 Leeds Old Road, Bradford.
 1912 E. FIRTH, J. DIGBY, F.L.S., 1 The Crescent, Hyde Park Corner, Leeds.
 1920 ... FLINTOFF, ROBT. J., F.C.S., Water Ark Lodge, Goathland, Yorks.
 1925 ... FLINTOFF, T., Fieldhead, Cavendish Road, Kersal, Manchester.
 1897 ... FOGGITT, T. J., Stoneybrough, Thirsk.
 1905 ... FORDHAM, W. J., M.R.C.S., L.R.C.P. D.P.H., Whinney House, Low Fell, Gateshead-on-Tyne.
 1909 ... FORREST, H. E., 'Hillside,' Bayston Hill, Shrewsbury.
 1926 ... FORREST, W. J., 43 Beaumont Road, Whitley Terrace, Bradford.
 1887 P. FORTUNE, RILEY, F.Z.S., 'Moorland,' Harlow Hill, Harrogate.
 1926 ... FOSTER, HENRY, 48 Ridge Road, Upper Armley, Leeds.
 1908 ... FOWLER, T. M., F.R.P.S., 'Cartrefi,' Windmill Road, Wombwell, Barnsley.
 1923 ... FRANKLAND, J. N., Overhouse, Cowling, Keighley.
 1909 ... FYRER, DR. J. H., Eastgate, Barnsley.
 1913 E. FYSHER, GREEVZ, Halcyon House, Chapel Allerton, Leeds.

- 1915 ... FYSHER, MRS. G., Halcyon House, Chapel Allerton, Leeds.
 1925 E. FYSHER, S. D. PERSY, Kingfisher Works, Sackville Street, Leeds.
- 1908 P. GARSTANG, Prof. W., M.A., D.Sc., F.L.S., The University Leeds.
 1886* ... GAUNT, Mrs. L., Hazelbrae, Farsley, Leeds.
 1915 L. GIBSON, EDWARD B., L.D.S., Croft Terrace, Hebden Bridge.
 1904 ... GIBSON, J., F.R.M.S., F.C.I.S., Elmfield, 192 Psalter Lane, Sheffield.
 1913 E. Gilligan, Prof. Albert, D.Sc., F.G.S., Geological Department, The University, Leeds.
- 1921 ... GLADSTONE, Major R. M., The Hollins, Grosmont, Yorks.
 1914 ... GOUGH, J. H., Ph.C., c/o Dr. Gott, Hampton House, Ilkley.
 1920 ... GRAINGER, Miss J., Wood Nook, Slaithwaite, Huddersfield.
 1924 ... GRAINGER, JOHN, Devonshire Hall, Headingley, Leeds.
 1915 ... Grainger, James Y., Willow Grove, Menston.
 1923 ... GRANGE, Miss M. E., 5 Monley Street, The Crescent, Consett, Co. Durham.
 1908 ... Greaves, A. E., 18 Fountain Street, Goole.
 1914 ... Greaves, Walter, 'Grimsgarth,' Park Drive, Rochdale Road, Halifax.
 1918 ... GREENWOOD, THOS. FENTON, Hurst Leigh, Birchcliffe Road, Hebden Bridge.
 1921 ... GREENWOOD, SAM, Nutclough House, Hebden Bridge.
 1907 P. GRIMSHAW, P. H., F.R.S.E., F.E.S., Royal Scottish Museum, Edinburgh.
 1921 ... Grist, W. R., B.Sc., 8 Moor Park Avenue, Headingley Leeds..
 1921* ... Grist, Mrs. W. R., 8 Moor Park Avenue, Headingley, Leeds.
 1927 ... GROOCOCK, Miss H., B.Sc., 7 Gill Street, Saltburn.
- 1887 ... HAIGH, G. H. CATON, M.B.O.U., Grainsley Hall, Gt. Grimsby.
 1902 ... HALEY, W. B., 9 Myrtle Road, Ravensthorpe, Dewsbury.
 1890 ... HALLIMOND, H. T., 'Escombe,' Sleights, S.O., Whitby.
 1919 ... HALLOWELL, ERNEST, 12 Edward Street, Sowerby Bridge.
 — P. HARKER, ALFRED, M.A., F.R.S., St. John's College, Cambridge.
 1908 ... HARROGATE PUBLIC LIBRARY, c/o G. W. Byers, Victoria Avenue, Harrogate.
 1897 E. Hartshorn, J., The Mount, Leyburn, R.S.O., Yorks.
 1921 ... HASTINGS, CUTHBERT, 93 Frizinghall Road, Bradford.
 1891 P. Hawkesworth, Edwin, 'Sunnyside' Crossgates, Leeds.
 1908 ... Haxby, Fred, 15 Hollingwood Mount, Lidgett Green, Bradford.
 1919 ... HEATON, HARRY, Cot Field, Roundhay, Leeds.
 1913 ... HEBDEN, THOS., Hainworth, Keighley.
 1924 ... HEEKLOTS, GEOFFREY A. C., B.Sc., Botany Department, The University, Leeds.
 1922 ... Hewlett, Miss M., M.Sc., 11 Bradford Street, Keighley.
 1919 ... Hilary, Miss Daisy, B.Sc., 15 Plevna Terrace, Bingley.
 1922 ... HILARY, HENRY OXTOBY, 'Fellfoot,' Bingley.
 1926* ... HILARY, Mrs. MABEL, 'Fellfoot,' Bingley.
 1925 C. HINCKS, W. D., 9 Grange Avenue, Leeds.
 1922 ... HIRST, ALBERT, 10 Talbot Avenue, Huddersfield.
 1910 ... HOBSON, BERNARD, M.Sc., F.G.S., Thornton, Hallam Gate Road, Sheffield.
 1895 ... HOLLINGWORTH, J., M.R.C.S., 2 Hornsea Parade, Holderness Road, Hull.
 1908 C. Holmes, John, 9 Campbell Street, Crosshills, near Keighley.
 1884 H.L. Horne, Wm., F.G.S., Market Place, Leyburn, R.S.O., Yorks.
 1921 ... HORRELL, E. CHAS., 23 Victoria Terrace, Belle Vue Road, Leeds.
 1909 E. Howard, G., Sitwell Vale, Moorgate, Rotherham.
 1927 ... HOWELL, KENNETH G., 50 Woodside, Burley, Leeds.
 1924 ... Hodgkinson, John, Rose Hill, Penistone.
 1923 E.C. HUDSON, ROBT. GEORGE SPENCER, M.Sc., F.G.S., Department of Geology, The University, Leeds.
 1924 ... HUDSON, H. F., 18 The Mount, Malton.
 1904 ... Hutton, W. Harrison, Sunny Garth, Ring Road, Moortown, Leeds.
- 1924 ... INGOLD, Prof. C. K., D.Sc., F.R.S., The University, Leeds.
 1924* ... INGOLD, Mrs. C. K., The University, Leeds.
 1904 ... Irving, J., M.D., Inagh Mount, 15 Filey Road, Scarborough.
- 1907 ... Jackson, E. W., F.C.S., Godrevy, Saltburn-by-the-Sea, Yorks.
 1924 ... JAGGER, Miss MARY E. M. A., M.Sc., 46 Mount Preston, Leeds.
 1922 ... JAMES, C. H., 1 Grange View, Chapeltown, Leeds.
 1907 ... JOHN CREARAR LIBRARY, c/o H. Grevel & Co., 33 King Street, London, E.C.
 1904 C. Johnson, J. W. H., M.Sc., F.G.S., F.I.C., Grange View, Walton, near Wakefield.
 1926 ... JOHNSON, G. C., 18 Hovingham Terrace, Harehills, Leeds.
 1907 E.C. Johnstone, Miss M. A., LL.A., B.Sc., F.L.S., 9 Victoria Avenue, Cheadle Hulme, Cheshire.
 1903 L. Jones, R. Fowler, Trinity House, Denton Road, Ilkley.
 1903 ... JORDAN, A., Claremont, Windsor Road, Doncaster.
- 1926 ... KAYE, Mrs. H., West Cliff, Keighley.
 1892 P.L. Kendall, Prof. Percy F., D.Sc., F.R.S., F.G.S., 1 Devas Road, West Wimbledon, London, S.W.20.
 1924 C. Kitchen, T. Basil, 23 Avenue Crescent, Harehills, Leeds.
 — L. Knubley, Rev. E. P., M.A., Steeple Ashton Rectory, Trowbridge, Wilts.
 1927 ... KELLY, Miss RUTH, Clifford, Boston Spa, Yorks.
- 1927 ... LAW, Miss IDA V., 4 Wilton Street, York.
 1902 ... Lawton, Fred, Bentley House, Skelmanthorpe, Huddersfield.

- 1926 ... LEALMAN, WILFRED S., West End, Kirby Moorside.
 1907 ... LEEDS PUBLIC LIBRARY, The Librarian, Leeds.
 1899 ... Lofthouse, T. A., F.E.S., 129 Albert Road, Middlesbrough.
 1910 ... LOTHERINGTON, E. B., Menethorpe, Stcney Road, Scarborough.
 1924 ... LOWTHER, R. C., M.B., Ch.B., F.E.S., Fernlea, Grange-over-Sands.
 1898 ... LUCAS, B. R., Winnington Lodge, Northwich, Cheshire.
 1919 ... LUMB, J. H., 32 Undercliffe Terrace, Scarbottom, Halifax.
 1907 ... Lumb, A. Haigh, Nab Drive, Shipley.
 1922 E.C. Lyle, George Trevor, F.E.S., Briarfield, Shibden, near Halifax.
- 1925 ... MACMILLAN, W. E. F., 42 Onslow Square, London, S.W.7.
 1908 ... MALONE, MICHAEL, 12 Northfield Place, Manningham, Bradford.
 1922 ... MARSHALL, Rev. C. C., M.A., St Chad's Vicarage, Far Headingley, Leeds.
 1919 ... MARSDEN, W., A.M.I.M.E., 186 Elms Road, Clapham, S.W.4.
 1914 ... MASON, C. W., 15 Park Avenue, Hull.
 1905 E. Mason, F. A., F.R.M.S., 29 Frankland Terrace, Leopold Street, Leeds.
 1923* ... MASON, HAROLD, 29 Frankland Terrace, Leopold Street, Leeds.
 1923 L. MAINPRISE, SYDNEY LEONARD, F.G.S., Wydale, St. John's Avenue, Bridlington.
 1901 ... MASSEY, HERBERT, F.E.S., Ivy Leigh, Didsbury, Manchester.
 1922 ... MAUGHAN, JOHN, Estate Office, Jervaulx, Yorks.
 1923 ... MAXWELL-STUART, H., Scarthingwell Hall, Tadcaster.
 1924 ... McIVER, D. G., Regent Court, Headingley, Leeds.
 1912 ... MEGSON, ALBERT, Fern Villa, Headlands, Ossett.
 1896 ... MELROSE, J., Clifton Croft, York.
 1894 ... MELVILLE, J. C., M.A., F.L.S., Meole, Brace Hall, Shrewsbury.
 1893 L. MILLS, F. W., F.L.S., F.R.M.S., Tormohun Court, Middle Warberry Road, Torquay.
- 1918 E.C. MILSOM, F. E., B.Sc., Glen Lyn, Station Road, Shepley, Huddersfield.
 1924 ... MINSHALL, Miss ELIZABETH, B.Sc., Girl's High School, Halifax.
 — ... Moiser, H. R., F.G.S., Howarth Grange, York.
 1926 ... MOREHOUSE, Mrs. E. M., 23 Queen's Road, Doncaster.
 1906 C. MORLEY, B., Windmill, Skelmanthorpe, Huddersfield.
 1921 ... MOSLEY, CHAS., M.B.O.U., Balholmen, Longley Road, Huddersfield.
 1925 ... MOULDEN, Miss M., B.Sc., Allen Croft, Bingley, Yorks.
 1920 ... MUSGRAVE, Miss E., B.Sc., 30 Lister Lane, Bradford.
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- 1925 ... NEAVE, SHEFFIELD A., M.A., D.Sc., F.Z.S., F.E.S., 41 Queen's Gate, London, S.W.7.
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 1923 ... NEWBOULD, W., 29 St. Michael's Crescent, Headingley, Leeds.
 1901 ... NEWCOMEN, G. H. T., Kirkleatham Hall, Redcar.
- 1922 ... ORDE-POWLETT, The Hon. NIGEL A., Bolton Hall, Leyburn.
 1920 ... OXLEY, H., Spenfield, Weetwood, Leeds.
- 1926 ... PARKIN, Mrs. EDITH (W. H.), 31 Bradford Road, Shipley.
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 1920 E. PEARSALL, W. H., D.Sc., F.L.S., The University, Leeds.
 1909 ... Peck, A. E., 'Tosti,' Avenue Road, Scarborough.
 1921 E.C. PERCIVAL, E., B.Sc., The University, Leeds.
 1893 ... PETCH, T., B.Sc., B.A., Tea Research Institute, Yuwara Eliya, Ceylon.
 1922 ... PHELON, HARRY VERNON, M.B., Ch.B., Ministry of Pensions Hospital, Leeds.
 1920 ... PHILIPS, Major G. W., 21 Lawn Road, Doncaster.
 1920 ... PICKERING, G. F., Woodcroft, Horsforth, Leeds.
 1911 ... PICKLES, A., Clog Bridge, Silsden, Keighley.
 1921 E. PILKINGTON, Miss E. W., 63 First Avenue, New Wortley, Leeds.
 1925 ... PING, ANDREW WENTWORTH, M.A., F.R.M.S., St. Olave's, Clifton, York.
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 1911 P.L. PRIESTLEY, Prof. J. H., D.S.O., B.Sc., F.L.S., The University, Leeds.
 1911 ... PRIESTLEY, Mrs., The University, Leeds.
 1911 ... PRIESTMAN, G. E., Hollin Grange, Ilkley, Wharfedale.
 1920 E. PROCTER, C. F., 522 Holderness Road, Hull.
 1898 ... PUNCH, J. W. R., Howe View, Castleton, R.S.O., Yorks.
 1894 ... PUNSHON, Mrs. R. N., Ingleby House, Northallerton.
- 1917 L. RATCLIFFE, Mrs. CHAS., Laverton Grange, Kirby Malzeard.
 1927 ... RAW, WM., M.B.O.U., Whitfield House, Goathland.
 1917 ... RHODES, FRED, F.E.S., 113 Park Row, Heaton Road, Bradford.
 1926 ... ROBB, Miss C. M., Catton Hall, Thirsk.
 1920 ... ROBERTS, T. N., 38 West Bank, Scarborough.
 1922 ... ROBERTS, ERNEST, M.A., 6 Sholbrooke Avenue, Chapeltown, Leeds.
 1898 ... Robertshaw, A. Gibson, Gordon Bank House, Midgely, Luddendenfoot.
 1922 ... ROBERTSHAW, WM., Hasslemere, Woodville Road, Keighley.

- 1923 ... ROBINSON, Miss F., 47 Athol Road, Heaton, Bradford.
 1922 ... ROLLINSON, Miss ALICE R., B.Sc., A.C.G.I., 11 The Terrace, Howard Park, Cleckheaton.
 1915 ... ROOME, GEORGE W., B.Sc., F.G.S., 21 Glen Almond, Ecclesall, Sheffield.
 1922 ... ROWE, JOSEPH HAMBLEY, F.S.A., 88 Horton Grange Road, Bradford.
 1922 ... ROWE, OSBERT HUGH CONSTANTINE, 88 Horton Grange Road, Bradford.
 — L. Rowntree, J. H., Scalby Nabs, Scarborough.
 1923 ... RUSSELL, P. L., Broughton Rise, Malton.
 1926 ... RUSSELL, J. T., 56 7th Avenue, Blythe, Northumberland.
 1923 ... RYAN, Miss EDNA, Geldhow Mount House, Harehills, Leeds.
- 1890 P. St. Quintin, W. H., J.P., D.L., M.B.O.U., Scampston Hall, Rillington, York.
 1908 ... Sanderson, A. R., Research Laboratory, Petaling, Federated Malay States.
 1897 ... SANER, C. O. F., Cottingham, near Hull.
 1907 ... SAUNDERS, F. W., 7 Yarborough Terrace, Bentley Road, Doncaster.
 1920 ... SCHROEDER, Rev. W. LAWRENCE, M.A., 2 Grosmont, Shaw Lane, Headingley, Leeds.
 1922 ... SCOTT, Miss LORNA T., B.Sc., Lyddon Hall, Virginia Road, Leeds.
 1922* ... SEATON, HERBERT TAYLOR, Kingswood, Grimscar, Huddersfield.
 1926 ... SEWELL, Mrs. A. H., Norland, Ruswarp Lane, Whitby.
 1886 ... SHEFFIELD FREE LIBRARY, The Librarian, Sheffield.
 1897 P.H.L. Sheppard, T., M.Sc., F.G.S., M.B.O.U., Director of Museums, Hull.
 1917 ... SIMPSON, J. R., The Limes, Selkirk, N.B.
 1912 ... SLACK, R., 2 Percy Street, Bingley.
 1904 ... SLATER, H., North End, Northallerton.
 1923 ... SLEDGE, W. A., B.Sc., 38 Kelso Road, Leeds.
 1917 ... SMART, Dr. H. DOUGLAS, 172 High Road, Salway Hill, Woodford Green, Essex.
 1920 ... SMITH, A. MALIN, M.A., F.L.S., Biological Department, Technical College, Bradford.
- 1907 C. Smith, Sydney H., F.Z.S., 25 Park Place, Huntington, York.
 1903 P. Smith, W. G., B.Sc., Ph.D., College of Agriculture, George Square, Edinburgh.
 1922 ... SMITH, F. B., M.D., 68 Cold Bath Road, Harrogate.
 1897 ... Snelgrove, E., B.A., Whiteley Wood, Sheffield.
 1904 E.C. Stainforth, T., B.A., B.Sc., 90 Ryde Street, Hull.
 1904 C. Stather, Major A. J., 206 Westbourne Avenue, Hull.
 1891 E.C. Stather, J. W., F.G.S., Brookside, Newland Park, Hull.
 1884 ... Stiles, M. H., F.R.M.S., 10 Avenue Road, Doncaster.
 1927 ... STUBBS, J. F., The Museum, Oldham.
 1908 ... SYKES, A. W., High Close, Kidroyd, Huddersfield.
- 1911 C. TAYLOR, E. W., Telford Terrace, York.
 — P.H.L. Taylor, J. W., M.Sc., North Grange, Horsforth, Leeds.
 1900 ... Taylor, Rev. T. H., M.A., University, Leeds.
 1897 L. TEAL, JOSEPH, Bankfield House, Yeadon.
 — ... TETLEY, C. F., M.A., J.P., Fox Hill, Weetwood, Leeds.
 1903 ... THIRKELL, E. W., Aldwark, Rotherham.
 1926 ... TETLEY, Miss URSULA, B.Sc., The University, Leeds.
 1911 ... THOMAS, HAMSHAW, H., M.A., The Botany School, Cambridge.
 1921 ... THOMAS, Rev. HAROLD, M.A., 102 Marcliffe Road, Sheffield.
 1921 ... THOMAS, ELTON, Hazelwood, Hebden Bridge.
 1890 E.C. Thompson, M. L., F.E.S., 40 Gosford Street, Middlesbrough.
 1918 ... Thornes, Albert E., Rylston, Ash Road, Headingley, Leeds.
 1926 ... THROUP, T., 2 Baptist Place, Bradford.
 1916 ... TODD, H. A., 6 Queen's Road, Linthorpe, Middlesbrough.
- 1926 ... VEALE, GEOFFREY, The Grove, Ilkley.
 1921 E.C. VERSEY, H. C., M.Sc., 21 Sholebroke View, Chapeltown, Leeds.
- 1911 ... WADDINGTON, THOS., Fairbank, Moor Allerton, Leeds.
 1907 E.C. WADE, E. W., M.B.O.U., North Ferriby, E. Yorks.
 1910 ... Wade, H., 10 Pitt Street, Barnsley.
 1908 ... WAGER, M. E., B.Sc., Cragg Road, Mytholmroyd.
 1894 P.C. Wager, Harold, D.Sc., F.R.S., F.L.S., 4 Bank View, Chapel Allerton, Leeds.
 1920 C. WALSH, GEORGE B., B.Sc., Linthorpe, Stepney Drive, Scarborough.
 1912 ... WARDE-ALDAM, Mrs. W. W., M.B.E., A.R.C.E., Hooton Pagnall Hall, Doncaster.
 1891 ... Waterfall, Chas., F.L.S., Dalmeny, Shavington Avenue, Chester.
 1920 ... WATSON, Rev. C. H., The Vicarage, Masham.
 1903 E.C. Wattam, W. E. L., 30 Towngate, Newsome, Huddersfield.
 1887 ... Watts, Rev. A., F.G.S., The Rectory, Wilton Gilbert, Durham.
 1912 L. WAUD, GEORGE C., Ferniehurst, Baildon, Yorks.
 1924 ... WENYON, CONRAD S., M.A., A.I.C., 58 Bankfield Road, Huddersfield.
 1918 ... WHITBY LITERARY AND PHILOSOPHICAL SOCIETY, The Museum, Whitby.
 1924 C. WHITEHEAD, B.Sc., 62 Brudenell Mount, Leeds.
 1891 ... WHITLEY, Rt. Hon. J. H., M.A., D.Litt., M.P., Brantwood, Halifax.
 1904 ... WILCOX, R. L., South Eastern Hospital, New Cross, London, S.E.
 1893 C. Wilkinson, H. J., 12 Minster Yard, York.
 1894 C. Wilkinson, Johnson, M.B.O.U., 75 New North Road, Huddersfield.
 1924 ... WILD, F. D., Whin Brow, Cloughton, Scarborough.
 1923 ... WILLATT, Major Wm. HENRY, Reighton Hall, Reighton, Bridlington.

- ... *Wilson, J. E.*, F.G.S., Hatch Cottage, Kingsley Green, Haslemere, Surrey.
 1920 ... *WILSON, Miss JANET*, 24 Milton Place, Halifax.
 1922 C. *WILSON, ALBERT*, F.L.S., F.R.Met.Soc., Tir-y-Coed, Roe Wen, Tal-y-Cafn.
 1927 ... *WILSON, WALTER*, 261 Manningham Lane, Bradford.
 1918 ... *WIMPENNY, R. S.*, Prawle, Roslyn Road, Gorlston, Gt. Yarmouth.
 1918 ... *WINTER, A. E.*, 148 Westland Avenue, Harrogate.
 1905 E.C. *Winter, W. P.*, B.Sc., F.G.S., 6 Grange Avenue, Hirst Wood, Saltaire.
 1890 P. *Woodhead, T. W.*, Ph.D., M.Sc., F.L.S., Technical School, Huddersfield.
 1923 C. *WRAY, Miss MARJORIE*, B.Sc., 31 Avenue Road, Newport, Shropshire.
 1922 *WRIGHT, W. B.*, B.A., F.G.S., Inglewood, Burlington Rd., Altrincham, Cheshire.
 1901 E.C. *Wroot, H. E.*, 99 Spencer Place, Leeds.

- 1921 ... *ZIMMERMANN, V. G. F.*, 7 Portland Street, York.

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 BERRY BROW NATURALISTS' SOCIETY.—T. Pearson, 14 Arloms Buildings, Newsome, Huddersfield.
 BOOTHAM SCHOOL NATURAL HISTORY SOCIETY.—H. Gilbert, Bootham School, York.
 BRADFORD NATURAL HISTORY AND MICROSCOPICAL SOCIETY.—A. Morrell, 2 Garfield Avenue, Bradford.
 BRADFORD SCIENTIFIC ASSOCIATION.—W. Bentley, 38 Wood View, Manningham, Bradford.
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 CRAVEN NATURALISTS' SOCIETY.—C. Farrell Ferriday, M.P.S., Dynely Road, Skipton.
 CROSSHILLS NATURALISTS' SOCIETY.—J. Holmes, 9 Campbell Street, Crosshills, Keighley.
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 HALIFAX SCIENTIFIC SOCIETY.—J. H. Lumb, 32 Undercliffe Terrace, Scar Bottom, Halifax.
 HEBDEN BRIDGE LITERARY AND SCIENTIFIC SOCIETY.—E. B. Gibson, Croft Terrace, Hebden Bridge.
 HECKMONDWIKE NATURALISTS' SOCIETY.—G. Ball, 16 High Street, Heckmondwike.
 HONLEY NATURALISTS' SOCIETY.—Fred Ricketts, 14 Reins, Honley, Huddersfield.
 HUDDERSFIELD NATURALIST, PHOTOGRAPHIC AND ANTIQUARIAN SOCIETY.—C. Mosley, M.B.O.U., 79 Longley Road, Huddersfield.
 HULL GEOLOGICAL SOCIETY.—J. W. Stather, F.G.S., Brookside, Newland Park, Hull.
 HULL SCIENTIFIC AND FIELD NATURALISTS' CLUB.—T. Stainforth, B.A., B.Sc., 90 Ryde Street, Hull.
 KEIGHLEY NATURALISTS' SOCIETY.—R. Butterfield, F.E.S., The Museum, Keighley.
 LEEDS CO-OPERATIVE NATURALISTS' FIELD CLUB.—Sydney Archer, 64 Stanhope Drive, Horsforth, Leeds.
 LEEDS GEOLOGICAL ASSOCIATION.—E. Hepworth, M.Sc., The Secondary School, Castleford.
 LEEDS NATURALISTS' CLUB AND SCIENTIFIC ASSOCIATION.—T. B. Kitchen, 23 Avenue Crescent, Leeds.
 MEXBOROUGH SECONDARY SCHOOL SCIENTIFIC SOCIETY.—Miss A. Gill, Secondary School, Mexborough.
 MILNSBRIDGE NATURALISTS' SOCIETY.—L. Garside, 360 Manchester Road, Milnsbridge, Huddersfield.
 OVENDEN NATURALISTS' SOCIETY.—E. Roberts, 10 Melbourne Street, Lea Mount, Halifax.
 ROTHERHAM NATURALISTS' SOCIETY.—R. Stewart, 12 Broomfield Grove, Rotherham.
 SCARBOROUGH FIELD NATURALISTS' SOCIETY.—C. B. Haigh, 22 Highfield, Scarborough.
 SCARBOROUGH PHILOSOPHICAL AND ARCHAEOLOGICAL SOCIETY.—A. I. Burnley, 69 Ramsey Street, Scarborough.
 SELBY SCIENTIFIC SOCIETY.—A. Hutchinson, Wistow Road, Selby.
 SETTLE NATURALIST AND ANTIQUARIAN SOCIETY.—Thos. L. Frankland, Langcliffe, Settle.
 SORBY SCIENTIFIC SOCIETY.—F. L. Neep, 39 St. Barnabas Road, Sheffield.
 SOUTH WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.—J. Hooper, 3 St. Giles Terrace, Overton, near Wakefield.
 SPEN VALLEY LITERARY AND SCIENTIFIC SOCIETY.—A. Pickering, Healds' Hall, Liversedge.
 WAKEFIELD NATURALISTS' SOCIETY.—Chas. W. Carr, 15 St. John's Square, Wakefield.
 WHITBY AND DISTRICT NATURALISTS' FIELD CLUB.—Miss L. Ingham, Esk House, Whitby.
 YORK AND DISTRICT FIELD NATURALISTS' SOCIETY.—A. Wentworth Ping, M.A., F.R.M.S., St. Olaves, Clifton, York.
 YORKSHIRE CONCHOLOGICAL SOCIETY.—John R. Dibb, 45 King George Avenue, Leeds.

YORKSHIRE NATURALISTS AT HAYBURN WYKE.

F. A. MASON, F.R.M.S.

THE first meeting of the year opened at Hayburn Wyke on Saturday, April 16th, for the Easter week-end investigation of the surrounding country. Except for a field park for cars by the roadside, between Cloughton and the village of Staintondale, a stranger would hardly suspect the presence of a railway station and hotel between the road and the sea. There, however, was situated the Hayburn Wyke Hotel, which served as Headquarters, and it proved to be too small for requirements, which resulted in the party being badly scattered. The weather was almost ideal, but the time was a little too early for the migrant birds and for most of the flowering plants. The ferns, of which there is a great wealth in the Wyke Woods, were only just beginning to unfold their fronds.

The excursion on Saturday, lead by Mr. A. I. Burnley, included a visit to Little Cliff, the undercliff leading southwards from the wood, and an examination of the Wyke Woods, through which runs the Hayburn Beck. The earlier spring flowers of these oak woods were well in evidence, and there were carpets of Primroses, Wood Anemone, Wood-sorrel, and less advanced, Woodruff and Moschata. Very fine clusters of Toothwort were seen.

During the same day the Conchologists, led by Mr. W. Gyngell, explored the rocky beach at the foot of the woods.

On Monday the party visited Helwath and Bloody Becks and Harwood-dale Moor. This excursion was made one of great interest through the intimate knowledge of the locality and its fauna possessed by our member, Mr. E. B. Lotherington, who acted as guide. The journey across the moors gave everybody an opportunity of noting how common is the Common Viper in this district, and Mr. Lotherington can manipulate a Viper in a way that brings out many of the creature's habits and much of its nature.

The show of Sweet Gale in flower attracted attention, and a Hawthorn showing a very unusual type of twig development was an object of special interest on this excursion. Dr. T. W. Woodhead explained that this structure resulted from excessively slow annual growth, the length of shoot being so small as to appear as a ring instead of a twig, and there were ten to twelve of these rings to the inch.

A General Meeting was held at Headquarters on Monday evening, under the chairmanship of Mr. H. B. Booth. Reports were received from the Chairman, and from A. I. Burnley, Miss D. Hilary, B.Sc., Greevz Fysher, F. A. Mason, J. W. Stather, W. P. Winter, B.Sc., and Dr. T. W. Woodhead, M.Sc.

Votes of thanks were unanimously accorded to Messrs. A. I. Burnley (Local Secretary) and to Mr. E. B. Lotherington. Six new members were elected.

Three members who took part in the excursion to Hayburn Wyke thirty-seven years ago—Messrs. W. J. Clarke, W. Gyngell and M. L. Thompson—were present at this meeting.

Many interesting observations were made in branches of study on which no reports have been received, and their omission is to be regretted.

VERTEBRATE ZOOLOGY (H. B. Booth):—The members of this section had an enjoyable time, although it was too early for many of the summer migratory birds, only the Chiffchaff and a single Wheatear being seen. On the undercliff the Common Wren was in numbers. Other species noted were the Carrion Crow, Marsh Tit, Bullfinch and the more common species. Off the coast the gulls were chiefly Herring Gulls and Kittiwakes.

wakes, and a few Common Cormorants and Fulmars were seen. More inland the following species were noted: Curlews, Red Grouse, Green Woodpecker, Grey Wagtail and Dipper. Nests seen (in addition to the more common species) were a Stonechat (near Goathland), with newly hatched young, a Long-tailed Tit, with four eggs, and a Stock Dove, with two eggs. This latter nest was in rather a curious position, viz., on the roots of a tree under an overhanging bank, on a steep slope of Bloody Beck !*

In mammals, the Badger appeared to be fairly plentiful, judging by the numbers of its footprints and its 'earths.' Small Trout were the only freshwater fish seen. Vipers were common in the valleys, and the hot sunlight suited them well. Many had just cast their skins and showed the clean pattern beautifully, and some of them (more particularly the males) were very drowsy.

CONCHOLOGY (Greevz Fysher):—With the assistance of Mr. W. Gyngell, of Scarborough, the occurrence of *Helix aspersa* on the Scurvy-grass along the cliffs was verified. The beach consists almost entirely of boulders of considerable size, but the surf is so often violent that these large stones are not allowed to remain very long in one position, and, accordingly, the acorn barnacles are not nearly so plentiful as is usual on a rocky beach. This seems to have the effect of keeping the *purpura* zone at a greater distance from high-water mark than is usual. None of the three low spring tides which occurred during the excursion was favourable for reaching the laminarian zone. The prevailing direction of the wind must have prevented the water from receding to an extent which might have been expected. The surf from the ground swell abated from day to day, and on Monday the fringe of the laminarian zone was accessible. Assistance in observation was obtained from Mrs. and Miss Kathleen Morehouse and Mr. Percival.

Littorina rufa was distributed far more widely than is usual, while *obtusata* was almost a rarity. The red variety of *L. littorea* was not very difficult to obtain.

The following is a list of all the species submitted to Mr. J. A. Hargreaves :—

MARINE.

Craspedochilus cinereus, *Mytilus edulis*, *Volsella modiolus* juv., *Patella vulgata* L., *Helcion pellucida*, *Gibbula cineraria*, *Lacuna divaricata*, *L. pallidula*, *Littorina obtusata*, *L. rufa*, *L. littorea*, *L. littorea* (red form), *Purpura lapillus*, *Nassa incrassata*.

NON-MARINE.

Lehmannia arborum, *Agriolimax agrestis*, *A. agrestis* var., *Vitrea crystallina*, *Polita cellaria*, *P. rogersi*, *P. alliaria*, *P. nitidula*, *P. pura*, *Euconulus fulvus*, *Arion hortensis*, *A. fasciatus*, *Gonyodiscus rotundata*, *Fruticicola hispida*, *Arianta arbustorum*, *Helicogena aspersa*, *Cepaea nemoralis*, *Cochlicopa lubrica*, *Marpessa laminata*, *Piostoma bidentata*, *Ancylus fluviatilis*.

GEOLOGY (J. W. Stather).—Because of the limited resources of the hotel at Hayburn Wyke, many of the geologists had to find accommodation elsewhere along the coast. This resulted in the party being divided into three or four small groups working independently of each other,

* In the public room of the Hayburn Wyke Hotel was a beautifully mounted specimen of the great Lammergeyer, or Bearded Vulture (*Gypaetus barbatus*), which we were informed by the manager 'had been shot locally' !! Mr. A. E. Peck kindly offered to 'ferret out' the history of this bird. It appears that it was originally in the private museum of the late Dr. Rooke, of Scarborough, and was stated to have been shot in Southern Spain.—H.B.B.

and it is therefore somewhat difficult to give a complete account of their doings.

(1) To the members staying at Robin Hoods Bay, Mr. F. G. Percival pointed out a very interesting section in the sea cliffs close to the town. Usually, the lias cliff south of the 'way foot' is hidden by thick masses of slipped glacial material. This, however, had been recently cleared away by the sea, and a low cliff of shale rendered visible for at least twenty yards. In its lower part the shales were level-bedded and quite undisturbed, but in the upper were much crushed and contorted, probably due to the direct action of ice. Photos and careful notes were taken of this section.

(2) At Ravenscar, another group studied the famous Blea Wyke beds. Many ammonites were obtained, and from one nodule in the *striatulum* zone, at least ten specimens of *Pseudolioceras compactile* were obtained. The undercliffs (Beacstliff), stretching from Ravenscar to Hayburn Wyke, were also explored.

(3) A third group, taking up their quarters at Cober Hill, near Cloughton, examined the Oolitic plant beds exposed on the shore of the Wyke.

(4) On Easter Monday, the groups joined forces, descended the cliffs at Hundale Point and worked northward along the shores to the point where the scar of Millepore limestone rises above sea-level. At Hundale the thick and fossiliferous beds of the Grey or Scarborough Limestone were examined, and many specimens were obtained, and on the broad flat scar which runs out to sea opposite the headland, innumerable traces of *Arenocolites*, a worm-like organism occupying U-shaped borings (described by Dr. F. A. Bather, F.R.S. (*Proceedings of the Yorkshire Geological Society* for 1925)), were noted for the first time in this locality. Thin seams of coal were also seen in the Estuarine Sandstone which overlies the Scarborough Limestone.

Leaving the Hundale sections behind, an attack was made on the famous plant beds on the north side of Cloughton Wyke, and notwithstanding the extreme brittleness of the shales, many good specimens were secured.

Proceeding still northward along the rock-strewn beach a brief visit was paid to the Millepore beds, which intersects the Esturines in this vicinity, when hammers and chisels once more became busy.

This ended the day's work, but a pleasant walk on the cliff top back to Hayburn Wyke enabled the leader to point out the 'Eller Beck' scar on the beach; and inland the Newlands Dale, a broad streamless valley parallel to the coast, through which the new railway runs, and which Prof. Kendall regards as marking a stage in the withdrawal of the North Sea Ice Sheet.

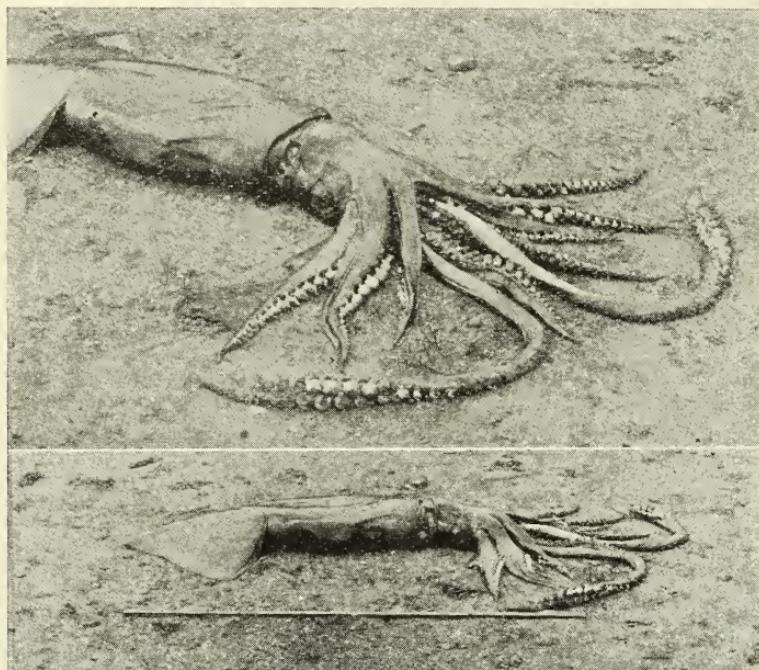
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Fertilizers: their Sources, Manufacture and Uses, by Herbert Cave (London: Sir Isaac Pitman and Sons, xi.+116 pp., 3/-). This is one of a series of the well-known volumes dealing with Common Commodities and Industries, issued by this firm. The work is written in a practical way, and will prove of value to all those interested in farming, artificial manures, etc.

The New Book of Trees, by Marcus Woodward (London: A. M. Philpot, 310 pp., 12/6 net). Dividing the various trees under those of Woodland, Hedgerow, Park and Garden, Coniferous, London, Seaside and Riverside, the author gives a chatty account of the various species, with numerous quotations from the poets, references to folklore, etc. The volume is professedly popular rather than scientific, and is illustrated by woodcuts by C. Dillon McGurk, and though the frontispiece, 'Weeping Wych Elm,' may be artistic, we thought at first it was the cloak of a Maori.

FIELD NOTES.

Giant Squid at Scarborough.—On March 18th, 1927, a large Squid was found stranded on the North Shore at Scarborough. It was dead when discovered, but was perfectly fresh, and the colours were bright and clean. In total length, including the long tentacular arms, it measured 5 ft. 3 ins. ; the body, from front edge of mantle to tip of tail, was 26 inches long. The head and longest tentacles measured 3 ft. 3 in. ; and it was 22 inches across the tail fin. The back,



from tip of tail to the ends of the tentacles, was bluish-black. The lower surface, sides, and both sides of the tail fin, were reddish-brown. The eyes were bluish-black, and the suckers, which were armed with toothed bony rings, were yellowish in colour. The specimen was sent to the Natural History Museum at South Kensington, and was identified by Mr. G. C. Robson as *Stenoteuthis caroli*.—W. J. CLARKE, Scarborough.

The Starry Ray (*Raia radiata*) in Yorkshire Waters.—During the last twelve months I have been searching for this pretty little Ray among the heaps of Skates and Rays of various species exposed for sale upon our local fish market. I find it a common fish here, and it is rarely that, on looking critically at the heaps, I cannot find several specimens. They are always of small size. On April 5th, 1927, I asked a

fisherman to save me a few rays too small to be marketable. He gave me ten picked at random solely because they were small ones ; every one was a Starry Ray. This species does not occur in the list of Scarborough marine fish made by Mr. Oxley Grabham ; nor in those left by the late Mr. Travis and Dr. Murray. There is only a doubtful reference to it in 'The Vertebrate Fauna of Yorkshire,' where it is referred to as 'one of the rarest of the Raiidæ occurring on the coast.'—W. J. CLARKE, Scarborough.

Potamogeton friesii in Yorkshire.—In my list of flowering plants collected at the Yorkshire Naturalists' Union meeting at Farnley Hall (see *The Naturalist*, November, 1926, p. 344), I recorded *Potamogeton obtusifolius*. I submitted the specimen to Mr. Arthur Bennett, and he has named it *Potamogeton friesii* Rupr. The original record therefore needs correction.—A. MALINS SMITH., Bradford.

Anaglyptus verrucosus, Oliv., in Yorkshire.—On April 22nd, Mr. G. C. Johnson, B.Sc., Leeds, passed to me a living beetle which he had that morning found creeping up a window-curtain at his house at Harehills. Its identity has been determined by Mr. H. G. Blair, of the British Museum (Natural History), as *Anaglyptus verrucosus* Oliv. 'It is a North American species, probably from Canada, and has no doubt been introduced with some American timber. I have no record of this species having occurred before in this country.'—CHARLES MOSLEY, The Museum, Huddersfield.

Pluteus patricius Schultz at Forge Valley, Scarborough.—This pink-spored agaric was first recorded for Yorkshire during the 1926 Fungus Foray, at Mulgrave Woods, where it grew in numerous large clusters on a large heap of old sawdust, by the site of a disused sawmill (see *The Naturalist*, December, 1926). On May 19th, 1927, I found it under identical conditions at Forge Valley—the same numerous clusters and individual toadstools with pileus of $6\frac{1}{2}$ ins. diam. and stems 1 inch thick. Thus the second record for the county quickly follows the first. I am expecting that fruit-bodies will be produced all through the summer and autumn. Unfortunately, the species belongs to a group suspected of being poisonous. At Forge Valley, as at Mulgrave, a few quite normal specimens of *Pluteus cervinus* also occurred. Upon my own property, at Seamer, is an old sawdust heap, round the edges of which very fine specimens of *Pluteus cervinus* are produced annually, and successive growths persist for months. These specimens are usually much larger than specimens found on tree stumps.—A. E. PECK, Scarborough.

Cumberland Coleoptera.—The following records of Cumberland Coleoptera refer to some of the less known parts

of the county. From Combe Crags, on the River Irthing, I have *Anthobium torquatum*, *Ochina hederæ*, *Helodes marginata*, *Malthodes minimus*, *M. flavoguttatus*, *M. pellucidus*, *Leistus rufescens* and *Campylus linearis*. From Corney Fell, over Ravenglass, I have *Athous vittatus*, *Corymbites quercus* var. *ochropterus*, and *Donacia sericea*. A *Sinodendron cylindricum* was picked up in Caldbeck village, and near that place a *Strangalia armata* was taken in the flower of a wild Rose. *Dascillus cervinus* was common on High Pike. *Cychrus rostratus* occurred under a stone at Calthwaite in July; *Antherophagus nigricornis* on flowers of an umbellifer in July, at Armathwaite. *A. pallens*, one in a lane at Drigg. *Cicindela campestris* was common in Eskdale, and at Wastwater, in July. *C. hybrida* on the sandhills at Drigg. At Pooley Bridge, in June, I captured *Quedius umbrinus*, *Stenus tarsalis*, *Bythinus bulbifer*, *Elaphrus cupreus* and *Coccinella io-punctata*. *Olibrus cæneus*, at Oulton, near Wigton; *Brachysomus echinatus*, one swept at Caldbeck, in July; *Ceuthorrhynchus rugulosus*, one beaten from Scentless Mayweed, near Oulton, in August, and one swept from nettles, near Floriston, in May.—JAS. MURRAY, Gretna.

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Four-footed Helpers, by Eleanor E. Helme, with coloured plates and line drawings by Barbara Briggs (London: The Religious Tract Society, 97 pp., 7/6 net). This is a series of large coloured prints, mounted on brown boards, with descriptions of the various animals depicted. Needless to say the animals described are the various beasts of burden used in different countries, and the matter has been specially prepared for young readers.

Bypaths in Downland, by Barclay Wills (London: Methuen & Co., xvi.+185 pp., 7/6). The author is a keen student of folklore, natural history and antiquities, and has a thorough knowledge of shepherds and their ways. His numerous photographs present various aspects of farming life, ancient and modern, and illustrations are given of a great number of 'bygones,' some of which seem peculiar to the Downs, as the present writer is not familiar with them in the north.

Tropical Aquarium Fishes: How to Breed and Rear Them, by A. E. Hodge (London: H. F. and G. Witherby, 128 pp., 7/6). This is a practical guide for those who are anxious to breed aquarium fishes, and as President of the British Aquarist Association and editor of *The Amateur Aquarist*, the author is thoroughly qualified for the work. The volume is well illustrated by diagrams and photographs of fishes suitable for aquaria, and deals with diseases, food, appliances, etc.

How Birds Live, by E. M. Nicholson (London: Williams and Norgate, x.+139 pp., 3/6 net). This is a brief account of bird life in the light of modern observations, the author being a keen student of W. H. Hudson, Julian Huxley and Edmund Selous. He has taken advantage of information derived from bird-marking schemes, and so on. After seven chapters there are appendices dealing with Bird Ecology; Some data as to casualties among Nests and Nestlings; Some data as to Bird Population; Height and Speed of Flight; Bibliographical Notes; and Scientific Names of Birds mentioned. The frontispiece is called 'The Way of the World,' and shows an Arctic Skua darting after a fish which a Roseate Tern has just relinquished.

NEW YORKSHIRE ALGÆ.

A. MALINS SMITH.

DURING the last two or three years' collections of algæ have been made which have yielded the following records new to Yorkshire :—

Vaucheria uncinata Kutz. Farnley Hall, Otley, 17/7/26.

Debarya lœvis (Kutz) West. Airton, 11/7/25 and 19/6/26.

Sphaerocystis schroeteri Chodat. Stoney Ridge, Bradford, frequently, 1925 and 1926.

Aphanothecæ castagnei (Breb.) Rabh. Farnley Hall, 17/7/26.

Peridinium cinctum Ehrb. Dowley Gap, Bingley, 23/6/26.

Vaucheria uncinata and *Debarya lœvis* are each recorded by Rich* in her 'Algæ of Leicestershire.' *Sphaerocystis schroeteri* is recorded by the Wests, chiefly as a plankton organism from the Lake District, but it is recorded by Fritsch and Rich,§ Rich,* Griffiths† and Delf ‡ for lowland pools, and is probably widespread.

Of the following algæ there is only one previous record for Yorkshire :—

Spirogyra calospora Cleve. This was first found in Yorkshire on the visit of the Y.N.U. to Sleights in 1915, and has not been recorded since. I have found it at Adel bog, 24/5/24, and in Shipley Glen, 12/7/26.

Edogonium rufescens Wittr. The first county record was made by the Wests from Austwick Moss (see *The Naturalist*, 1908). I have found it at Stoney Ridge, Bradford, frequently, and with fully developed reproductive organs so as to be identifiable, on 17th June, 1926. It is recorded by Rich* as *f. exiguum*, and as var. *Lundellii*, but apparently the normal form was not met with by this author.

Since Farnley Hall was somewhat unfamiliar ground, I give a short list of the identifiable algæ found there on the visit of the Yorkshire Naturalists' Union, 17/7/26, including the two new records already given :—*Vaucheria uncinata*, *V. terrestris*, *Volvox* sp., *Chaetophora elegans*, *Zygnuma cruciatum* and *Aphanothecæ castagnei*.

Specimens of the algæ on which these records are based have been submitted to Prof. F. E. Fritsch, who has very kindly confirmed or corrected my identifications.

* *Journal Bot.*, 1925.

† *Journal Ecol.*, XI., p. 184, 1923.

‡ *New Phyt.*, XIV., p. 63, 1915.

§ Fritsch and Rich, *Ann. d. Biol. lacustre*, VI., 1913, p. 9.

NORTHERN NEWS.

A correspondent calls attention to an interesting item under 'Books for Sale' in a recent natural history journal : it is Schwartz's '*Casual Geology*'.

From Mr. E. Leonard Gill, formerly of the Newcastle Museum, we have received his *Report of the South African Museum* for the year ended 31st December, 1926, from which it appears that he is enthusiastically carrying out his new duties.

Mr. Henry Crowther, of the Leeds Museum, is retiring after forty-three years' service, and a movement is on foot to make a presentation to him in recognition of his work at the Museum. He estimates the value of the collections under his charge at £150,000.

In an illustrated interview with Sir Arthur Keith, appearing in one of the London papers, he says : 'Our work for the most part is in terms of thousands of years. Here is a tibia (leg bone) which has just come from Ipswich and is 10,000 years old.' It would be !

We learn from *The Daily Express* that naturalists have revived recently the discussion of an old problem—does the whale sleep on the surface or in the depths of the sea ? It is difficult to understand how an air-breathing animal could go to sleep at the bottom of the sea.

A hundred thousand pounds has been placed at the disposal of the American School in Athens for 'starting' excavations at Agora. We want a two-hundredth part of this to preserve a mediæval tithe barn in Yorkshire, have sent out over 6,600 appeals, and cannot get the amount !

The Yorkshire specimens figured in No. LXIII. of *Type Ammonites*, issued in April, are *Ammonites tenuicostatus* [now *Tenuidactylites tenuicostatus*] from Whitby ; *Dactylioceras commune* [now *Koinodactylites communis*, in one instance, and *Curvidactylites curvicosta* in another] from the Liias at Whitby.

Mr. W. S. Bisat, President of the Hull Geological Society, is representing British Geologists at a Conference of Geologists interested in Carboniferous Zonal Geology, at Haarlem, in Holland. There is an extensive programme, and Mr. Bisat is giving an account of recent work in Great Britain to the Conference.

From Mr. Hans Schlesch we have received a reprint from *Archiv fur Molluskenkunde*, containing the following notes : Ueber *Xerophila caperata* Montagu in Danemark under Norddeutschland ; Zur Najadenfauna N. O. Nigeriens ; Zweiter Nachtrag zur Molluskenfauna von Schleswig ; Lettische Süsswassermollusken ; Kleine Mitteilungen.

From Mr. G. Erdtman we have been favoured with various notes dealing with Pollen-statistics, reprinted from *Svensk Botanisk Tidskrift* ; also 'Literature on Pollen-statistics published before 1927,' reprinted from *Geologiska Föreningens i Stockholm Förhandlingar*. For Great Britain and Ireland alone there are thirteen papers, dealing with thirty-eight localities.

The Zoological Collections attached to the University Department of Zoology at Sheffield have recently received a valuable addition in the form of a collection of British Butterflies and Moths. It was presented by Mr. J. H. Doncaster, and was collected by the donor's uncle, Mr. Arthur Doncaster, about forty years ago. The collector was one of the heads of the well-known firm of naturalists, Watkins and Doncaster.

The press informs us that at Bilton, near Hull, a pair of owls nested in an old elm tree, and the 'family' having manifestly arrived, two young nature students decided to have a peep at the inside of the nest. They found : three owlets (alive), three dead mice, a dead starling, two dead sparrows, two dead moles, bones, broken eggs, paper, a tram ticket, an envelope, and skulls of birds. In the same tree was found a jackdaw's nest, which contained pieces of string, 'bus tickets, paper, grass, leaves, feathers, and horse hair, but neither eggs nor young.

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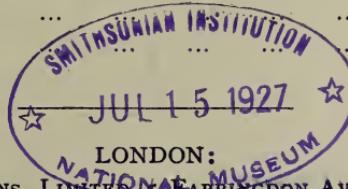
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EPISODES IN THE HISTORY OF
KINGSTON UPON HULL

— FROM THE DATE
OF ITS FIRST CHARTER ONWARDS

BY

G. J. MONSON-FITZJOHN, B.Sc., F.R.Hist.S.,

*Author of "Quaint Signs of Olde Inns," "Drinking
Vessels of Byegone Days," etc.*

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Sea Holly (*Eryngium maritimum*).

From Herbs of Healing.

By EDWARD STEP.

Published by Hutchinson & Co., London.

NOTES AND COMMENTS.

SEA HOLLY (ERYNGIUM MARITIMUM).

‘ From ancient days the aromatic roots of Sea Holly, under the name of Eringoes, have been regarded as aphrodisiacs ; and probably on this account were at a later date candied to form a favourite sweetmeat, still used as a tonic. But the reputed range of its medicinal powers was much wider than this. A decoction of the root in wine was said to open obstructions of the spleen and liver, to help yellow jaundice and dropsy, and to expel the stone. If the roots were simply bruised and applied “ to the kernels of the throat, commonly called the king’s evel,” or to the place stung or bitten by any serpent, it would heal speedily. Or, if after bruising they were boiled in old hog’s grease, and laid on to the places where splinters of broken bones, thorns, etc., remained in the flesh, the foreign body would be withdrawn and the place healed. If the whole herb could be taken young and tender, and a distilled water made from it, this might be drunk for any or all of the purposes aforesaid, as well as to relieve the melancholy of the heart and to dispel agues. One other thing this drink would do : it would put right a stiff neck that could not be turned without turning the whole body.’*

HERBS OF HEALING.

The above is a description given to one of an enormous series of British plants by Mr. Edward Step in his book on ‘ Herbs of Healing.’† When the leader of a large party of members of the British Association to Spurn a few years ago seriously stated that the Sea-holly was known as the ‘ Resurrection Plant ’ locally, because if one sat upon it he would ‘rise again !’ he little thought that the plant had so many other attributes. The sample in the preceding paragraph gives an additional interest to Botany, provided the matter is not taken too seriously. About eighty species are dealt with in the volume, and many of these are illustrated. One we are permitted to reproduce (see frontispiece).,

A NATURALIST AT THE DINNER TABLE.‡

After reading this book we are satisfied that if there is one person with whom we do not wish to dine it is A Naturalist. More than one of our favourite dishes have now been tasted for the last time. Octopus, worms, snails, insects, maggots, and so on, may be all right under the cloak of a French name, but now we know what they are—ugh! The late Frank Buckland, at one time Curator of the Zoo, ‘ had a passion for

* In ‘ A Book of Values of Merchandise Imported, according to which Excise is to be paid,’ printed in 1657, there is the entry ‘ Sea Holly Roots, the pound. 1s. od.’—ED.

† London : Hutchinson & Co., xiii. + 206 pp., 10/6 net.

‡ By E. G. Boulenger. London : Duckworth, 160 pp., 6s. net.

sampling new dishes, and during his tenure of office fairly ate his way through the Regent's Park Menagerie. Monkey, Zebra, Crocodile, Ostrich—these and many other creatures came beneath his knife and fork. When failing health compelled him to exercise more caution, he still indulged his bent for gastronomic adventure—but by deputing servants, keepers, and even a dustman were bribed to partake of the Zoo's "late lamenteds," and were required to report on their edibility—or otherwise.'

QUEER FOODS.

We learn that 'Frank Buckland was a distinguished member of the merry but short-lived Acclimatization Society, which held its first dinner in a London Tavern in 1859. The menu included Pike, Kangaroo, Bear, Eland, Trepang, Octopus and Grasshoppers. The writer [*i.e.*, the author, not the reviewer!] has tasted all the above items with the exception of the last named, insects not appealing to his, possibly too fastidious, palate.' On another page we find that 'Conger-eel soup . . . is the small restaurateur's favourite way of using up otherwise unsightly heads and tails. The soup is put through a sieve, and again boiled with the addition of milk and mussels. The tough leathery whelk may similarly be converted into an excellent broth.' One of these days on visiting Soho we shall expect to see on the menu 'E. G. Boulenger bouillé' !

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

The Leeds Philosophical Society was the first of its kind founded in the county, dating back to 1818, and was followed by Hull and York in 1822, Whitby in 1823, and Scarborough in 1827. All these societies still exist. Those at Hull and Leeds have handed over their Museums to their Corporations; Scarborough is anticipating doing so, and Whitby and York still possess their collections. All the Societies have issued Annual Reports fairly regularly, and, in addition, occasional monographs or other contributions in the form of *Transactions*. In 1837, 'Volume I., Part I.', of *The Transactions of the Leeds Philosophical and Literary Society* was published, and contained papers on Water, Mollusca, Coin Moulds, *Actinia*, *Alcyonella* and the Yorkshire Coalfield. The Society then ceased publishing anything separate from its Annual Reports, beyond the Guides to the Museum.

A NEW PUBLICATION.

In 1925, however, the Leeds Corporation having helped the Society financially, Part I. of the *Proceedings* of the Society appeared; Part II. in January, 1926; Part III. in October, 1926; and Part IV. in March, 1927. The four, containing twenty-eight monographs, occupy 176 pages. A set has just been sent to *The Naturalist*. We will frankly admit that

Professor Brodetsky's 'Equations of the Gravitational Field in Orthogonal Co-ordinates'; E. C. Stoner's 'Atomic Moments of Ferromagnetics'; and J. Lamb's 'A 15-ic Resolvent of the Binary Sextic,' are beyond us, though admittedly of value and interest to others. Naturalists, however, are catered for in the following monographs:—'Study of the Effect of Diurnal Periodicity upon Fibre Production,' by G. Redington and J. H. Priestley; 'Fatty Substances of the Plant Growing Point,' by E. Rhodes and R. Woodman; 'Developments of Botrylloides and the Ancestry of Vertebrates,' by S. L. Garstang and W. Garstang; 'Atmospheric Pollution in Leeds during the Four Years, 1922-1925,' by B. A. Burrell; and 'Relation of Cork Formation to the Endodermis in the Shoot of the Dicotyledon,' by J. H. Priestley.

BRITISH ORCHIDS.*

'There are nearly fifty British species of Orchids belonging to about twenty genera. They are all terrestrial species, that is, there are no epiphytic forms, such as are common among tropical orchids. Two are saprophytes, living on decaying vegetable matter and having a dense cluster of swollen roots. All of the species possess what is called "mycorrhiza," that is, their food is absorbed by a fungus which lives in the outer layers of the roots. Without this fungus the plant cannot grow, and since the fungus also only grows under suitable conditions, orchids are usually restricted to a very definite type of habitat, are difficult to cultivate, and are often scarce and easily exterminated. They are difficult to study from pressed specimens alone, since they lose their characteristic colouring and markings, and generally turn black or brown in drying. Dried specimens accompanied by coloured sketches of the flower are therefore very welcome in collections, especially in the insectiferous group (*Ophrys*) where the markings of the lip are often the most characteristic feature of the species. Their interesting and peculiar floral characteristics are closely connected with their adaptation for pollination by various insects, often by a particular insect; thus the British *Epipactis* is fertilised by wasps. But some, such as the Bee Orchis, are self-fertilised, while the rare *Cephalanthera rubra* does not appear to set any seed, possibly for lack of visits by the right visitor. Hybrid forms, though rare, have occurred between many different species, twenty-seven being given in the latest British list. The minute dust-like seeds are spread by the wind and may be

* The above is taken from one of the leaflets issued with coloured post-cards, series 3-6, which have recently been issued by the British Museum (Natural History), at 1s. a set of five.

carried long distances. They will only germinate in association with the fungi already mentioned.'

MARINE BIOLOGICAL ASSOCIATION.

The *Journal* of this Association continues to contain memoirs of such importance that every zoologist must consult its pages. The May issue contains 'The Relation of the Plankton to some Chemical and Physical Factors in the Clyde Sea Area,' by S. M. Marshall and A. P. Orr; 'Fragmentation in the Genus *Autolytus* and in other Syllids,' by E. J. Allen; 'A Revision of the Genus *Portunus*,' by R. Palmer; 'Mode of Feeding of the Hermit-crab, *Eupagurus bernhardus*, and some other Decapoda,' by J. H. Orton; 'Observations on the Fal Estuary Oyster Beds during 1926, including a Study in Over-fishing,' by J. H. Orton; 'Shell-Depositions in Oysters,' by J. H. Orton and C. Amirthanilgam; 'Absorption of Ions from Sea-water by Sand,' by F. P. Stowell; 'Experiments on Sex-Change in the European Oyster,' by J. H. Orton; Physiology of Sex and Sex-Determination,' by J. H. Orton; and 'Influence of Plankton on the Phosphate Content of Stored Sea-Water,' by R. Gill.

MIMICRY IN INSECTS.

Two sets of post-cards, printed in colours, illustrating this subject, have recently been issued by the British Museum (Natural History), South Kensington. With each set (issued at one shilling) is an explanatory leaflet, from which we learn that :—'Insects have many remarkable ways of defending themselves against birds and other creatures that prey upon them. Some possess stings, some secrete an explosive fluid ready to be discharged in the face of an attacker, some are protected by their nauseous flavour and others are so extremely hard as to be unsuitable for food. One of the strangest forms of defence, however, is the unconscious imitation, by insects not protected in any such ways, of others that are so, with the result that their enemies are deceived and pass them by. The term Mimicry, in this sense, was first applied by H. W. Bates, the great English traveller-naturalist, to certain remarkable instances, discovered by him, of protective resemblance in insects. In these cases, insects, protected from birds and other insectivorous creatures by the possession of a disagreeable flavour, are involuntarily imitated as regards their colours, patterns, and general appearance by other kinds not so protected, which by the deception secure at least partial freedom from attack.'

WATER ENGINEERS.

At the recent conference of Water Engineers held at Scarborough,* Dr. Herbert Lapworth, in his Presidential

* From *The Yorkshire Post*.

Address, said the benefit of science lay not so much in the knowledge that was acquired during a brief University or College course, but partly in the grounding in scientific principles, and most of all in the training in scientific method. Within their own time great advances in waterworks engineering for the direct application of science had been secured. Research into the chemistry and biology of filtration and the treatment of water had effected material reduction in capital cost and greatly increased freedom and safety in the use of doubtful waters. This would probably result in a wider resort to river waters in the not too remote future, when our upland and underground sources of pure water had become largely exhausted.

GEOLOGY OF SCARBOROUGH.

Mr. R. C. S. Walters gave a paper on 'The Geology of the Scarborough District,' in which he dealt with the recent landslip at Scarborough. Between 1886 and 1890 the Royal Albert Drive and sea wall was constructed from the designs of Sir Wheatley Eliot, and extensive drainage works were carried out. In 1915, it was found that there had been a general lowering of the whole bay, right up to the toe of this sea wall, of 6 ft. The wall had also moved forward by amounts up to 7 ft. in 1921, or 4 ft. between 1918 and 1921. Upon examination of the shales in the foreshore in front of the wall at low tide, after heavy gales which had removed the overlying sea-sand, a zone of fractures penetrating these shales was revealed.

OUTCROP OF FRACTURES.

The outcrop of the fractures was nearly parallel to the coast line, their dip being landwards at an angle of 70 deg. or 80 deg., and the shale in the vicinity of this fracture was uplifted. Indeed, it was most probable that the rock reefs, situated at least 200 feet in front of the sea wall, had also been uplifted owing to pressure of the coastal cliffs moving forward. Such bulging of the foreshore had also been noticed at the South Bay, some centuries ago; also more recently at Holderness, Axmouth, Sandgate, and the Panama Canal; but, hitherto, in the North Bay, it had not been noticed owing to the scouring of the soft material as uplift occurred.

REMEDIAL WORK.

In this instance there appeared to be two movements, a surface movement in the boulder clay, and a deep-seated movement in the older estuarine shales beneath it, the latter being due to thrusts of the superincumbent weight of saturated boulder clay. By the remedial works, which had been carried out by Mr. H. W. Smith, namely, removing a large mass of the boulder clay, battering the slopes, and draining

the undercliff by large trenches filled with rubble, it was hoped and believed that any further forward movement of the cliff and upward movement of the foreshore had been checked. So far, detailed measurements by Mr. Smith from fixed transit lines indicated that all forward movement had ceased.

ABERYSTWYTH ZOOLOGISTS.

Under the editorship of Prof. R. Douglas Laurie, the Department of Zoology of the University College of Wales, Aberystwyth, has issued its *Report on Marine and Fresh Water Investigations* (76 pp., 5/-). The editor points out that 'In the present issue Mr. Watkin reports further work upon the Cardigan Bay herring; in endeavouring to piece together a story of their migrations he has found it necessary to examine samples from the Bristol Channel and from the Cornish coast round to Plymouth. He discusses the data collected during the four years, and sketches a provisional scheme of migration, frankly tentative and requiring confirmation or modification in the future. Cardigan Bay fish are large, with a size limit of 30 cm., which may be reached at the end of the sixth year. Observations on the scales indicate that there was poor growth in the summer of 1919, and that the growth was good in 1923. As Professor D'Arcy Thompson has criticised the view that the rings on the scale indicate annual growth, the evidence in the present paper in support of a belief in their annual character is of interest.' The publication also contains a description of a new species, the Estuarine Triclad (*Planaria amara*), by Blodwen Fox.

WILD FLOWERS.

The Society for the Promotion of Nature Reserves has issued a useful poster which reads as under :—

SAVE THE FLOWERS

BY PICKING SPARINGLY

If picked, the flowers last but a little while, and, unless a sufficient number of them is left to seed,
the plants will disappear

The beauty of the countryside would be sadly marred were no flowers to bloom on the banks or
in the woods

DO NOT UPROOT PLANTS OR BREAK TREES OR SHRUBS

Plants and trees, as Nature placed them, are a delight to the eye :
let all who pass by enjoy them

Copies can be obtained from the Secretaries, British Museum (Natural History), London, S.W.7.

ABNORMAL DEPOSIT OF SALIVARY CALCULUS IN THE ANGLO-SAXON.

G. H. WEBB, H.D.D., ETC.

As a general rule, all early skulls, whether British, Roman or Anglo-Saxon, found in East Yorkshire, are remarkable for their excellent dentition and freedom from tartar. An Anglo-Saxon skull, however, has lately been excavated under the supervision of the Hull Director of Museums, which shows a very unusual feature. The site was one which had previously

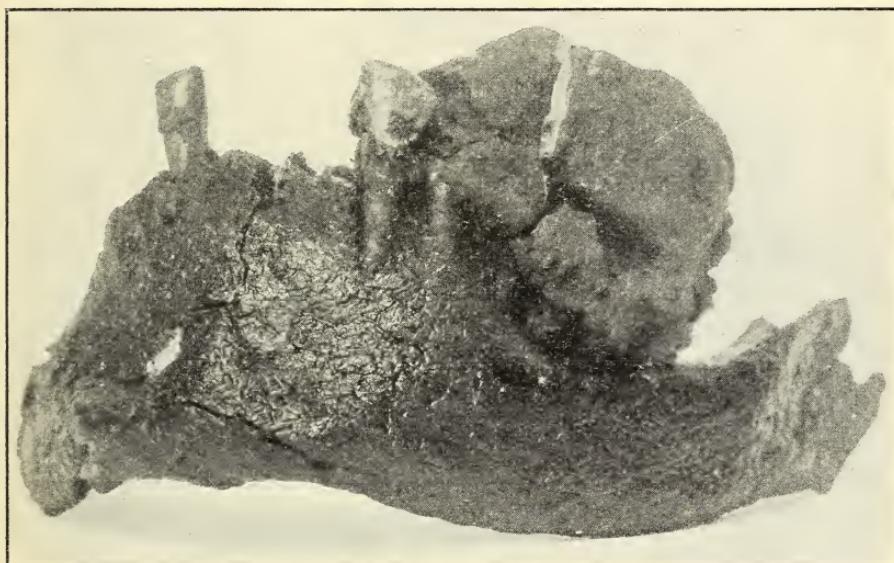


Fig. 1.

yielded many Anglo-Saxon remains, with the pottery and ornaments often buried with them. The maxilla is not, unfortunately, in a very good state of preservation. Although it has no teeth in position, it is probable that the jaw was not edentulous at the time of death. The mandible, which is in good condition, has in position $3 \mid 3456$. Of the other teeth $21 \mid 12$ showing empty sockets, have evidently been lost after death, and the remainder were definitely lost previous to death, since the alveolus has shrunk in the normal way. On the left side, completely covering the crowns of $\mid 456$, and extending backwards over the shrunken alveolus for a further inch or so, is a huge mass of salivary calculus (fig. 1). It is

* Reprinted, by permission, from *The British Dental Journal*, Vol. XLVIII., No. 10.

fairly common for the modern practitioner to see a piece of calculus as large as a tooth, but this mass is easily ten times as large as any other I have ever seen. It is considerably larger than a walnut, and weighs just $\frac{3}{4}$ oz. (Troy), including the three teeth to which it is fixed (fig. 2). The upper surface is shaped with deep hollows as though upper teeth had once fitted to that surface; otherwise the outline is rounded, excepting part of the lower surface which fitted to the now non-existent lower gum tissues. When found, the mass was split into three pieces which articulated perfectly together. The calculus is of the usual consistency and colour, excepting for a slight superficial brown pigmentation which tints the skull as a whole. This excessive deposit would cause mastication to be almost impossible, and speech to be very considerably

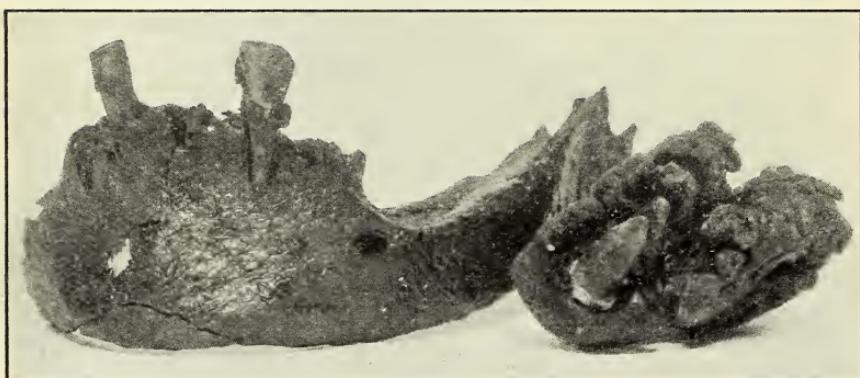


Fig. 2.

hampered. A theory which may account for its presence is that the Anglo-Saxon probably suffered from some degree of fixation of the mandible, due to disease or some other unknown cause. This would cause lack of use of the teeth, and correspondingly encourage abnormal deposition. He would probably take liquid food through the gap at the right side, or possibly through some gap in the upper incisors.

—:o:—

We regret to note the death of Professor E. H. Starling, C.M.G., F.R.S. An account of his work, and of the valuable discoveries he made to medical science, appears in *Nature*, No. 3002.

We find the following note in *Nature*: 'Biologists will be surprised to learn that Prof. Julian S. Huxley is resigning the chair of zoology at King's College, London, to which he was appointed less than two years ago. We understand that Prof. Huxley will still continue to be attached to King's College in an honorary capacity, but he intends to devote himself entirely to writing and research. Thus a new situation is created with regard to the purveyors of knowledge and their relation to academic institutions, a situation which all who are concerned with the spread of knowledge will do well to examine thoroughly.'

EAST YORKSHIRE MAMMALS.*

T. SHEPPARD, M.SC.

IN dealing with the question of the Mammalian Fauna of the East Riding of Yorkshire, it is as well to bear in mind the great changes which are constantly taking place due to agriculture and other operations; drainage and so forth; the ramifications of railways; new roads, and the penetration of almost every nook and corner by cycle and motor car.

We have evidence that formerly the Wold area was an almost impenetrable forest, while the low-lying land of Holderness was a land of meres and marches resembling the Norfolk Broads of to-day, and upon the islands in the surrounding waste of waters, early man and early animals thrived. Each year marks a greater scarcity in the number of wild animals in the British Isles, whether they be mammals, birds, reptiles, or insects; hence it is necessary that some effort should be made to record those with which we are still familiar, or, if possible, to set apart selected areas, where these might have a chance of surviving for the future, as within the past hundred years many valuable and interesting members of our Wold fauna have disappeared from the district, probably for ever.

Looking back, it is astonishing what an enormous variety of mammalia has thrived in East Yorkshire. The Museum at Hull possesses teeth, tusks and bones of dozens of different elephants, of two different species, found in the district. There are also teeth and other remains of rhinoceros, hippopotamus, reindeer, moose, bear, walrus, and animals of that kind, which certainly roamed about in these parts in the early days when man was thriving in the southern part of England; though, so far, in East Yorkshire we have found no human remains in association with the animals mentioned. Another animal formerly resident here, a somewhat unexpected discovery, was the lion, a skeleton of which was found near Market Weighton in a bed of peat many years ago, the remains being divided between the Museums at York and Hull. These extinct animals, perhaps fortunately, have long since left the area; but they indicate how different must the conditions once have been when they were able to thrive here. At a later period, when we know man existed in these parts, we find associated with him remains of the wolf, beaver, great Irish elk, red deer, fallow deer, bison, wild boar, the old English ox (*Bos longifrons*) with very small

* This is one of a series of B.B.C. talks to scholars, dealing with the natural history of East Yorkshire, which we have been asked to print.

horns, a small wild horse, goats and other animals of that kind. Possibly many of these would be domesticated, and help man in his work, or provide him with food and clothing. The red deer persisted in East Yorkshire, in practically a wild state, certainly up to the reign of King Charles I., as we have records of a hunt of these animals at Thorn Moor, when scores of them were driven into the water and drowned. Remains of the beaver indicate the presence of an animal now a native of Scandinavia, Canada, etc., where conditions are much more favourable for it to live. A skull of a beaver was found at Wawne, near Beverley, some years ago, and beavers' teeth and other remains are frequently found in the Bronze-Age barrows or burial mounds on the Yorkshire Wolds. To-day, unfortunately, for reasons already stated, our wild animals are becoming fewer. The demand made upon the countryside for timber during the War did much to destroy the hiding places of many interesting species. Another difficulty also is that people with guns who should know better, and other people who obviously are ignorant, have done their best to destroy animals which would otherwise be of great interest and certainly are harmless.

By 'mammals,' of course, reference is made to warm-blooded animals which suckle their young. Usually they are looked upon as four-footed and fur-coated, but it so happens that occasionally they fly in the air, as in the case of various species of bats, or they swim in the sea like fish, as the whales, grampus, dolphins, porpoise and others. However these mammals may be adapted for their particular mode of living, they still retain their mammalian character, and it is just as wrong to call a whale a fish as it would be to call a bat a bird or a mouse an insect.

With regard to whales, these represent the very largest animals of any description existing on the earth to-day, and in former times, during the old whaling days, provided occupation to a large proportion of the inhabitants of Hull, on account of their thick coating of blubber, or fat, which provided oil, and their baleen or 'whalebone,' which provided valuable flexible material for the manufacture of all manner of objects.

Some very important scientific records relating to whales have been made in East Yorkshire. A century ago a young whale known as Sibbald's rorqual, called after the great naturalist Sibbald, was washed up at Spurn. At that time this was the very first of its kind known to man, and the skeleton was secured by the old Literary and Philosophical Society at Hull, and has been in Hull ever since. It extends from one end of the Museum to the other, and yet is only half grown, a full grown specimen reaching the enormous length of ninety feet or more, and weighing several tons.

Another remarkable find occurred many years ago at Tunstall, when a sperm whale, fifty-six feet long, was washed up, and was the cause of an extensive law-suit, but eventually was claimed by the Lord of the Manor, and is now at Burton Constable Park. This seems to be about the only record of the sperm whale, which is a southern or Antarctic species, for this district. The animal was provided with numerous massive conical teeth, instead of the baleen which occurs in the Arctic whale.

Other species of marine mammals have been taken in the district, and are preserved in the Museum of Shipping and Fisheries at Hull. Among them is a beautiful seal, of which different species are known. These are usually looked upon as Arctic species, but as a matter of fact it breeds in large numbers on the English coast, especially in the Wash, where in recent years, it seems sad to have to record, it has reached such enormous numbers that the Ministry of Agriculture and Fisheries has had to take steps to reduce them by shooting, on account of the abnormal quantity of fish they ate, to the detriment of the local fishermen. Occasionally specimens, usually young ones, are washed up at various parts of the Holderness Coast from time to time; and we have one in the Museum which was actually caught within the Hull docks, having entered when the dock-gates were open. The records for the Yorkshire coast include the common seal, marbled seal, harp seal, grey seal, and the hooded seal.

Among the land mammalia, probably the largest wild example to-day is the fox, which owes its existence in the numbers it does to the sport it affords to the hunters. There are deer still preserved in certain gentlemen's parks in the area, but these can hardly be looked upon as wild in the strict sense of the term.

A much persecuted but harmless animal still exists among us in the form of the badger. This curious little beast, which more resembles a bear than anything else, may perhaps be looked upon as a member of that family. Its method of living is such that it does no harm to human beings, nor to their property in any way, and it seems a great pity that misguided people should hunt and kill the animal whenever an opportunity occurs. Fortunately there are still a few secluded corners in the Riding where the animal is able to survive.

Another interesting and beautiful resident, bordering on extinction, is the otter. This occasionally occurs in the trout streams and more inaccessible parts of East Yorkshire, and feeds largely upon fish, for which reasons it receives little mercy from the angler, though it would be a great pity if his energies resulted in the extermination of the species, as if once it disappears it may never be seen again. As illustrating

its fearlessness and tameness, a family of otters has lived under an arch crossing the Ouse at York, and both the father, mother and family have been watched besporting themselves in the river.

A still further valuable denison was the marten, though this has been extinct in East Yorkshire for many years. There are different species of this animal, the beautiful fur of which is still in great demand for ladies' wear, and the late Sir Henry Boynton secured some of the last of their race many years ago, which are preserved in our Natural History Museum. In an extraordinary way occurrences of this species are recorded in different places, though its home in Britain to-day is confined to the mountainous districts such as North Wales, the Lake District, and similar areas. Only a few years ago a specimen was caught at Barmston, in East Yorkshire, where it had caused a little consternation in the farmyard. It was not in the very best of condition, but was secured by Mr. C. Procter, a well-known local naturalist, who exhibited it, and in this way there was no doubt about its identity. Otherwise it often happens that ferrets or stoats are recorded as martens. The occurrence of this particular animal at Barmston is difficult to account for. The only possible solution seems to be that it has wandered here from its original home in the Lake District, or similar distant place, a journey which seems almost inconceivable for so small an animal. At the same time odd occurrences of a similar nature in recent years in other parts of the British Islands seems to indicate that this wiry little animal is able to travel great distances.

Stoats and weasels are perhaps better known in the district; certainly they are familiar in the woods where rabbits, pheasants, etc., are preserved, and gamekeepers lose no opportunity of trapping them.

The beautiful ermine, the white fur with a little black patch representing the tip of the tail, so much in demand for royal wraps, and for ladies' furs, is allied to the stoat in our district, but the ermine represents the winter coat. These animals, as with many others, are able to change the colour of their coats from brown in the summer to white in the winter, in this way protecting themselves from their enemies by their resemblance to their surroundings.

Perhaps one of the most beautiful and harmless of our mammals is the squirrel, with its timid ways and its beautiful long bushy tail, which acts as a sort of balance while it nimbly runs round the tree trunks, or jumps from branch to branch. It is very pleasant watching the antics of a squirrel. Formerly the only species we had in these parts was the brown squirrel, which I well remember was quite common at Hessle, Tranby, and other numerous places quite close to the city, but in

recent years seems to have become very scarce. On the other hand the American grey squirrel, the one with which all visitors to Regent's Park and the Zoo are familiar, was introduced into this district some years ago, and has multiplied to an enormous, if not almost to an alarming extent, so much so that apparently finding its natural food, to which it was welcome, not plentiful enough, it has taken to eating the young shoots of trees, and in this way has become harmful. Consequently its numbers have had to be reduced.

There are some mammals in the area which the keenest of naturalists and the most humane of persons would not encourage. I refer, of course, to rats and mice. The rats in these parts consist principally of two forms, the brown rat and the black rat. The latter is said to be the original British species. At one time it is stated all the rats in this country were black, but when by means of shipping, the brown rat from Alexandria was introduced into this country, it soon took possession of the district and drove the black rat out, although in one or two places, as at Bristol and Hull, the black rat still survives. It occurs in the warehouses in High Street to-day in great numbers, and many have been trapped by myself in order to supply specimens to different museums in the country requiring them. Quite apart from the damage caused by rats to grain and other forms of food supply, which is bad enough, every effort should be made to exterminate them, as they are carriers of plague. Their method of feeding and living is such that germs of some of the more distressing of plagues to which human beings are subject are carried from place to place by means of these rats. One very important duty of the Medical Officer of Health and his staff is that of examining the various ships coming to Hull, and taking the necessary precautions either to kill any rats on board or to prevent them landing here. It is not at all uncommon to find rats infected with plague. In Hull we have a 'Rat Week,' when special efforts are made to exterminate the species, but at all times everything should be done to prevent them getting an entry anywhere.

Mice, charming as they are to look at, in their small way also do considerable amount of harm to food stuffs, and should be trapped whenever possible. There are, of course, various forms of wild mice, voles, and similar species which still survive in the country districts, and the harm they do may be negligible. Some of these, however, seem to be getting very scarce. I have, for example, for years been trying to secure the pretty ball-like nest of a harvest mouse, which formerly used to be frequently met with when cutting the corn, but so far all efforts have failed to secure a single example.

Probably the best known of our local mammals, on account

of their food value, are the hare and rabbit. On the more inaccessible parts of the Wold area, where enormous fields of several hundreds of acres exist, the hare is perhaps as plentiful as in any part of the north of England, and enormous bags are secured by shooting parties at certain parts of the year. The hare is almost too well known to receive any description, but its habit of remaining perfectly still when suddenly disturbed often saves its life when an attempt to run away would certainly be fatal. This is so characteristic that I have heard a farmer state that in certain of his fields he would undertake to secure as many examples with a spade as another man would with a gun. Rabbits, of course, are rather different in their method of living, and, unlike the hare, prefer to live in colonies ; and gravel hills or loose soil in woods and places a little from the beaten track are favourite breeding places of this mammal, in some instances several hundred living together within quite a small space. Formerly the Wolds were largely occupied by rabbit warrens, and thousands and thousands of these animals disported themselves at will, and no efforts of the greatest of shooting parties seem appreciably to decrease their numbers. The Sykes family, of Sledmere, however, in reclaiming the Wolds, transformed them from rabbit warrens to the fertile farming lands which they now are, and the rabbits as a consequence disappeared from many of these places.

With regard to mammals which fly in the air, these, of course, are confined in this country to the bats, of which different species occur, but all are equally interesting and harmless. They will be familiar on summer nights, when they can be seen flying about over the pools and in the lanes, catching the insects upon which they live. Their home is usually in an old hollow tree trunk, in a church bell tower, or other similar safe retreat, in the roof of old houses and similar situations. Occasionally they occur in enormous numbers, and recent records are known where several hundreds have been seen to emerge from a single hole in a barn.

During the daytime, when the light is too powerful for their eyes, they hide in various dark recesses, and sleep in the unusual position of hanging head downwards, covering their bodies with their curious umbrella-like wings. The body is covered with fur, and the wings really consist of a thin membrane which joins the bones of the fingers, which are tremendously elongated for the purpose.

While I have not referred to every possible species, there are two fairly familiar mammals still briefly to be referred to, namely, the hedgehog and the mole. Each of these is by no means uncommon, and they are very familiar to children in the country. The hedgehog is a curious little beast with

a pig-like nose, and is protected by a veritable armament of sharp spines in place of hairs. It has a curious habit of tucking its nose in and rolling itself into a ball, and is in this position, surrounded entirely by these needle-like spines, which are sufficiently formidable to protect it against attacks by dogs or other enemies. The hedgehog is blamed for milking cows, but we think this must be put in the same category that adders swallow their young and that geese come from barnacles growing on trees.

The last of our little beasts is the mole, with its very small eyes and enormously powerful front paws which enable it to burrow so successfully and quickly in the soil. Usually it is of great value to the farmer, as it lives upon the grubs which are likely to harm his crops, though, on the other hand, when they become too plentiful, say, on a nice grass lawn, the great mounds of earth which they throw out get it into disrepute. Its velvet-like fur is in great demand for ladies' cloaks, though, on account of their small size, it takes a large number to make a garment. I remember years ago seeing strings hung from tree to tree along the whole length of a large wood on the South Cave road, upon which were several thousand of these little animals which had been caught by the local mole-catcher and were exhibited to indicate his ability! To-day such a collection would be exceedingly valuable if sold to a furrier.

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REVIEWS AND BOOK NOTICES.

The Log of the Sun: A Chronicle of Nature's Year, by W. Beebe. London: Hodder & Stoughton, 288 pp., 3/6 net. This is a series of fifty-two essays dealing with familiar natural objects from a somewhat unusual angle. Several of the articles have previously appeared in well-known American journals, the reputation of which is a guarantee of the excellence of "The Log of the Sun."

Some Destructive Household Insects, and How to Combat Them, by A. M. Stewart. Paisley: Alexander Gardner, 47 pp., 2/- net. In this pamphlet the author gives illustrations and useful information relating to furniture beetles, clothes moths, cockroaches, house-flies, and also writes on 'How some insects travel.' The articles are well illustrated, and the book should have a ready sale.

An Introduction to Biology, by Alfred C. Kinsey. London: J. B. Lippincott & Co., xiv.+558 pp., 9/- net. In this closely printed volume of nearly six hundred pages, containing over four hundred illustrations, almost every possible aspect of botanical and zoological life is dealt with by the Professor of Zoology in the Indiana University. The illustrations, principally from photographs, and also maps and diagrams, are remarkably helpful, and includes recent and fossil species. The chapters deal with Taxonomy, Morphology, Physiology, Genetics, Ecology, Distributional Biology, Behaviour, etc., and at the end is a bibliography of reference books and a thoroughly good index. We doubt whether such a book could be produced in this country at so low a price. The volume deals largely with American species, but a knowledge of these will be of service to any practical biologist.

The Elements of Geology, by Mary A. Johnstone (London : T. Nelson & Sons, x.+285 pp., 3/6 net). The author of this work, a frequent contributor to this Journal, is personally acquainted with many of our readers who during the past quarter of a century have taken part in field excursions. In the earlier days her frequent query 'How do you know that?' resulted in probably much more information being elicited from the leaders than otherwise would have been the case. Miss Johnstone has profited by these meetings, and a perusal of her interesting volume, with its wealth of illustration, reminds us of the days when we were able to take a twenty-mile ramble up hill and down dale or along the cliffs with the merry party that then was. In the preparation of this work the author has kept in mind the needs of the student and teacher and of those who desire more general accounts of the geography of any area ; and while northern illustrations necessarily take a prominent part, the book is by no means confined to any particular district. As a



High Force.

W, Whin Sill; S, Altered Shales; L, Limestone.

head teacher of more than local reputation, the author has been able concisely to give a readable account of the particular aspect of the earth's history, dealt with in each chapter. At the conclusion of each, also, is a summary ; and there is a glossary, a classification of strata, and a good index. The reviewer is flattered to find to what an extent he has been able to assist in the preparation of this useful volume, which he strongly recommends to his readers, as its perusal will remind many of them of pleasant geological rambles made together. On the last page we find the following :—'Lingula to Man. Between them winds the procession of the myriads of earth's peoples. Lingula was not earth's first-born ; who shall say that Man need be the last of her children ?'—T.S.

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Under the head of 'Prehistoric Mammals in Ireland' in the May number of *The Irish Naturalists' Journal*, Mr. H. E. Forrest reviews the occurrence of extinct mammalia in various parts of England, including the northern counties.

FIELD NOTES FROM AUSTWICK.

(Whitsuntide, 1927).

CHRIS. A. CHEETHAM.

A GRADUAL improvement in the weather as the week progressed helped to make insects, which were scarce at Grassington, more plentiful.

A special effort was made to follow up the idea mooted at the Entomological Section Meeting in October, when it was suggested that the scarcity of the Crane Fly (Daddy long legs) in the early months of the year might be due to the open winter giving birds more opportunities for devouring the 'leather-jacket' grubs. This may possibly be the case with *Tipula paludosa* Mg. and *T. oleracea* L., which are the chief pests to the agriculturist; and these species failed to produce a single specimen during the week. Far too little is known of the life histories of other species of the genus, some of which appeared in quantity. The habitats which follow may be a guide for further investigation. In the drier pastures, *Tipula vernalis* Mg. was abundant and widespread, and so was *T. luna* Westf. (*lunata* of list) in rough damp places.

These were far the most abundant species. On peaty places, such as Helwith and Austwick Mosses, *Prionocera turcica* F. (*T. diana* of list) and *T. subnodicornis* Zett. (*plumbea* Wlk.) still held on, though less plentiful than at an earlier date. On these Mosses the Globe flower and Cranberry were in full bloom, and *Salix pentandra* L. offered food to all insect visitors. Bog-bean flowers were almost over, but the pool on Austwick Moss, where the Water Violet (*Hottonia palustris* L.) has been introduced, was full of bloom.

The only Dragonfly seen was the Red-eyed *Pyrrhosoma nymphula*; by one hedgeside these were in hundreds. On approaching Austwick Moss, the Curlews, Redshanks and Lapwings were soon flying around and piping loudly, and an occasional Snipe drummed, while a pair of Carrion Crows in the Pine Wood was quickly awing and giving an alarm. Sedge Warblers chattered as if out of temper, and very occasionally the trill of the Grasshopper Warbler was heard, but most frequently later in the evenings. The Reed Bunting was also often seen. By the hedgerows, *Tipula unca* Wied. (*longicornis* Schum.), *varipennis* Mg., *lunata* L. (*ochracea* Mg.), *maxima* Poda. (*gigantea* Schr.) and *Pachyrrhina maculata* Mg., were taken.

Among the diptera were *Idioptera pulchella* Mg., *Limnophila abdominalis* Staeg., and *Antocha vitripennis* Mg. Syrphids were not plentiful: *Sericomyia lappona* L., *Chrysotoxum arcuatum* L., *Leucostoma lucorum* L. and a few *Chilosia*, *Syrphus* and *Platychirus* were seen; and other good captures

were *Sciomyza pallida* Fln., *Ditænia schænherri* F., *Lemnia unguicornis* Scop. and *Sciodromia immaculata* Hal.

A visit about 8 p.m. showed *Limnophila nemoralis* Mg. flying in numbers on the Moss, with males of the mosquito *Culicella morsitans*; while by the pine wood, small swarms of *Ephelia marmorata* Mg., danced, and the small empid, *Rhamphomyia geniculata* Mg. (*plumipest*) hawked in the air.

One object was to find the habitat of the fly known as *Pogonomyia meadei* Pok., now *P. brumalis* Rnd. Previously odd specimens had been taken about this date, and careful search was rewarded by finding it on buttercup flowers on the Moss Lane side; generally with its dark wings widespread and quite noticeable.

In the woods, *T. scripta* Mg. was the most plentiful, with odd specimens of *T. flavolineata* Mg. and *hortulana* Mg. By the streams both *T. lateralis* Mg. and *T. montium* Egg. were caught.

Leaving the low-lying ground, and going into the hills at a place where the hillside is always wet with many small runlets of water, *T. prumosa* was plentiful; and on the drier parts *T. alpium* Bergr.; and here, close by a small plantation, *Pachymeria femorata* F. was taken freely.

Away high up on the hillside, where wet rocks were covered with dripping masses of moss, many *T. cheethami* Edw. had emerged, and the empty pupa cases were projecting from the damp moss, while the insects were plentiful, mostly resting on the vertical rocks. With them were a few of the finely marked *Pedicia rivosa* L., and the delicate *Tricyphona straminea* Mg.

On the limestone pavement, on Oxenber, numbers of *T. variicornis* Schum. (*Pachyrrhina annulicornis* Mg.) were seen in and out of the crevices in the rocks, and evidently breeding in these places. These specimens are smaller than the same species from the lowlands.

On Oxenber a search was made for the nests of the ant *Formica fusca*, with which *Microdon mutabilis* L. lives in the larval state. This has been known for some time from Bastow Wood, Grassington, and the places are very similar. The effort was successful, and one rock, about 2 feet by 1 foot, when turned over, showed over a score of the pupa cases, though practically all were empty. This was a pleasant surprise, but time was too late in the day to expect to see the insects. A move was made to see the wild Columbines, which here, on the limestone, are a lovely blue shade with occasional whites. These are much more beautiful than the Columbines found a mile or two away across the great fault, and on the grit rocks, when the colour is a dingy reddish purple. Near the Columbines was a nice show of the flowers of the vivi-

parous bistort, and a surprise reward for search in the woods below was the lesser Winter-green (*Pyrola minor*).

The next day proved fine and sunny, and the opportunity was taken to visit the Microdon spot again. Two pretty moths were flitting in the sunlight. These Mr. B. Morley has identified as *Pyrausta purpuralis* L. (*ostrinalis* Hb.) and *P. cingulata* L.

A long search for Microdon on the flowers of Hawthorn, Holly and Rowan, and sweeping around the vegetation, was unsuccessful ; but when about to leave the spot a low humming note drew attention to a rock close at hand, where the long-sought specimen of Microdon sat in the sunshine. It took short flights from rock to rock, and gave a good opportunity to see it alive and in the field, and the desire which had caused many journeys to Grassington was gratified on the sunny top of Oxenber.

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Les Echinodermes des Mers d'Europe, par R. Koehler. Tome second, 16mo, 340 pp., double plates x.-xviii. Paris : Doin, 1927. Price 35 francs. The first volume of this useful handbook, containing the Starfishes and Brittle-stars, was noticed in *The Naturalist* for 1924 (p. 255). This volume deals with the Sea-Urchins, the Crinoids, and the Holothurians. Each class is preceded by a brief account of the general anatomy, which introduces the reader to the various terms employed. For each genus and species the chief synonyms are indicated and references given to such works as will enable the student to complete his knowledge. The descriptions are more than merely diagnostic, but are not so long as to be wearisome. The colour of each species in the living state is noted, and the geographical and bathymetric distribution carefully recorded. At the end of the systematic part is a general chapter on the distribution of the Echinoderms in European seas, which groups the species in the following regions :—Littoral Arctic ; Abyssal Arctic ; Littoral Boreal, with northern and southern sub-divisions ; Littoral Lusitanian ; Abyssal Boreal and Lusitanian ; Mediterranean. A fairly full list of literature, a table of contents, and a systematic index to the whole work complete the volume. With this work now completed, with H. L. Clark's Catalogue of Echinoidea in the British Museum, and with the Handbooks of Mortensen to the Echinoderms of Denmark and of the British Isles, the European student of this phylum is now well provided. There are, as one might expect, differences between the views of these three authors. Professor Koehler, for instance, barely mentions the *Democrinus parfaiti* of Perrier, which has been re-established by A. H. Clark ; on the other hand he gives *Annacrinus wyville-thomsoni* as found off the British Isles. His account of certain Holothurians that may any day be discovered in British seas is more detailed than that of Mortensen. Therefore the working naturalist, even though he may have Mortensen's weighty book on his shelves, should be glad to purchase the two volumes of Koehler as pocketable companions. Misprints appear rather too often, e.g., *sizygic* for *syzygic*, *Wywille* for *Wyville*, *Thomsoci* for *Thomsoni*, *Carpentier* for *Carpenter*, *Videnk* for *Vidensk* are contained in five pages. This may not be a serious defect, but we regret to see that Professor Koehler has not yet attained to a clear comprehension of the term 'centro-dorsale,' or why does he characterize it as 'improprement appelée ?' —F. A. B.

FIELD NOTES.

Cantharis (Telephorus) darwinianus Sharp. in Yorkshire.—Some time ago I was interested in finding among the insects belonging to this genus in my collection an example of *C. darwinianus* Sharp. The specimen was taken on the coast at Eston-in-Cleveland in June, 1900. This species was described by the late Dr. Sharp in 1866, from specimens found on the Scottish estuarine shore at Aberlady. In the North of England the beetle was discovered on the Southport and Birkdale shores by the late Dr. Chaster and Mr. Sopp (*vide* W. E. Sharp's 'Coleoptera of Lancashire and Cheshire,' 1908); while Mr. F. H. Day finds it commonly on the Solway Marshes. An interesting addition can, therefore, now be made to the Yorkshire list.—M. L. THOMPSON, Middlesbrough.

Diptera Notes.—The following insects were taken by Mr. F. W. Edwards on a recent hurried visit to Yorkshire, his purpose being to see the latest work of our late member, Mr. Geo. Grace :—At Addingham : **Camptocladius gracilis* Goet., **C. exiguis* Goet. In Grass Woods : **Macrocerata parva* Lundst., **Scatopse nigripennis* Mg. Bolton Woods : *Speolepta (Polylepta) leptogaster* Winn, *Tanyptus dubius* Mg. (*pusillus* Mg.). Bramhope Ponds : *Chironomus tentans* F., *C. impar* Wlk. (dispar of earlier lists), **Cricotopus angustus* Goet. (Verr. MS.), **Tanytarsus cf. lestagei* Goet., **Corynoneura celeripes* Winn. Adel : *Sceptonia fumipes* Edw. Those marked (*) are additions to the County list.—CHRIS. A. CHEETHAM.

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The Twenty-second Annual Report of the Manx Museum and Ancient Monuments Trustees contains details of the additions to the collections made during the year and illustrations of the more important.

From the *Annual Report of the Dorman Memorial Museum, Middlesbrough*, just received, we learn that a relief model of South Durham and North-east Yorkshire has been added to the Geological Gallery.

We notice in the Annual Report of the Curator of the Somerset County Museum, Taunton Castle, that Mr. John E. Pritchard, F.S.A., has presented ten Bronze Age implements to commemorate the completion of twenty-five years' service of Mr. H. St. George Gray as Curator. The Director of the Museums at Hull has recently completed twenty-five years' service. Will anyone 'celebrate' it?

The Thirty-sixth Annual Report of the Royal Society for the Protection of Birds deals with The Oil Menace, Protection of Wild Fowl, Watching Stations, Lighthouses, Afforestation, Moor-burning, Bird-Sanctuaries, Royal Parks, Bird Protection Orders, The Plumage Act, Bird Protection, 1925, and other subjects of interest to all lovers of birds. The lists of supporters and subscribers are also encouraging.

The Caradoc and Severn Valley Field Club has issued its *Record of Bare Facts*, containing a tremendous series of observations in the various sections of the club's activities, together with meteorological notes; and also the Society's *Transactions* for the year 1926, containing summaries of the papers read at the meetings, records of the field excursions, etc. A summary of Miss Frances Pitt's paper on 'The Skomer Vole,' which appeared in *The Naturalist* for 1926, is included.

NATURAL HISTORY OF GRASS WOOD AND ITS ENVIRONS.

F. A. MASON, F.R.M.S.

THERE are only a few woods in Yorkshire that will satisfy the same body of naturalists for exploration on three consecutive days. Grass Wood (with the adjoining Bastow Wood, and its inclusion, Far Gregory) is one of them, and Grassington, with Grass Wood as the objective, was the meeting place for the 334th Excursion of the Union during Whitsuntide, June 4th-6th. Despite generally unsettled weather conditions, fine weather prevailed during the working hours of each of the three days, and the evening rains served to enhance the condition of the wood for most purposes.

The route to Grass Wood from Headquarters by the river and Ghaistrills was the one most frequently used, and it would indeed be difficult to find a more delightful preamble to a day's excursion than is the walk by this reach of Upper Wharfe. Grass Wood is credited with a florula of about 400 species of flowering plants, many of them of considerable rarity, and it was not surprising that botanists and entomologists outnumbered members of other sections when the party commenced operations on Saturday. With the President (Wm. Falconer) and W. P. Winter, B.Sc., working as arachnologists; J. M. Brown, B.Sc., Rosse Butterfield and Chris. A. Cheetham leading the entomologists; J. Beanland, W. H. Burrell, H. Foster and A. Malin Smith, M.A., in the vanguard of the botanists; together with H. B. Booth and W. J. Forrest looking after the interests of the zoologists, such an excursion was bound to be a success. Not alone by new material and added fact should success be measured, but also in terms of example and assistance rendered to less experienced and younger naturalists, upon whom will devolve the pleasurable but responsible task of carrying on the work and traditions of the Union. Miss E. W. Pilkington was fully occupied and had plenty of assistance in the collection of galls; E. Percival, B.Sc., leading the solitary and semi-aquatic life which characterizes his presence on our excursions, obtained much new information with regard to the freshwater biology of the district; while the writer, experiencing no inconvenience by reason of having become detached from the party for a short while, devoted some attention to the fungi. A small party of geologists, under the guidance of J. Holmes, took alternative routes, as reported by Mr. Holmes below.

On Sunday, under the guidance of Mr. J. Crowther, and accompanied by members of the 'Upper Wharfedale Historical and Antiquarian Society,' including Messrs. Wm. Brighouse, H. Frankland, S. Stubbs and F. Todd, members of the Union were conducted to various places of archaeological interest in the neighbourhood of Grass Wood. Before leaving on this excursion, inspection was made of the contents of the Museum, collected by Mr. Crowther during forty years' residence in the district, many of the objects having been found in the course of his own excavations. Among the more interesting of these is the gigantic skeleton of a man found in High Close Pasture—a man who, we were assured, could not have stood fewer than 7 ft. in height. A large number of flint scrapers, flint spear-heads and arrow heads testify to the presence of the Stone-age man in this part of Wharfedale, and a recent acquisition is a very beautiful example of a flint arrow found by Mr. A. Waters, on Lea Green, in February of the present year. An ancient British urn, in which were deposited a partially-cremated human skull and other bones, crowns of human teeth, and a grey flint barbed arrow-head,* together

* This is accidental, and can have no connexion with the urn.—ED.

with pieces of charcoal, form an exhibit of great interest and archaeolog-ical value. Roman coins (including a bronze piece of Constantine the Great, A.D. 337, and another of Antonius Pius, A.D. 145, found in Grass Wood), pottery, weapons and other specimens indicative either of Roman occupation or Roman influence are abundant, as are also relics of a lost lead-mining industry and of a later mediæval community.

After leaving the Museum, the first halt was made at Borrans meadow. It appears to be generally accepted that the occurrence of the place-name 'Borran' is an indication of a Roman site, but it is significant that in each of a number of cases investigated by Mr. Crowther in the district, e.g., Borrans at Linton, Coniston, Littledale, etc., there is clear evidence of the site having been previously occupied by an early British people. Mr. Crowther would therefore regard the name Borran as an indication of a 'Romano-British' site. Certainly there is plenty of evidence of early British occupation from this point upwards to High Close Pasture and on to Lea Green Settlement. Here it may be remarked that the Ordnance Survey Maps locate the camp at Sweet Side, whereas the latter place is a good deal east of the position in which it is mapped, a topographical error which, on Mr. Crowther's representation, will be corrected in future editions of the map. The remains of Druidical Circles, Fortifications and Tumuli cover a large area, and permission is being sought by the local Society to excavate certain portions which are expected to yield valuable information.

Mr. Crowther's knowledge of the rarer plant habitats was an asset on this excursion. *En route* to Grass Wood, after leaving the Camp, the locality from whence came the earliest specimens of *Polygala amarella* Crantz, collected by the late John Cryer in 1902 (*The Naturalist*, 1903, p. 192) was pointed out, and it is pleasing to chronicle that the plant is increasing in numbers. After dropping down to Grass Wood by a path alongside the old lead-workings, a final halt was made by the round wall enclosures, said to be ancient British circles; here also was pointed out a 'kitchen midden' from which fragments of pottery have been gathered from time to time. Space will not permit of a longer account of the many interesting things seen, or of a report of the many discussions to which they gave rise during this very pleasurable day.

Monday once more saw the party, augmented by members and associates from Bradford, Keighley and Skipton, in Grass Wood. This time a thorough survey was made of the less known parts of the wood under the very able guidance of the woodman, W. Whitaker. It is safe to say that no one can claim to know the Wood so well as Mr. Whitaker, and the lists and notes appearing below have all gained substantially from his useful knowledge, not only of the topography of the Wood, but of its natural history also.

A General Meeting was held on Monday under the chairmanship of the President (Wm. Falconer). Reports on the work of Sections and Committees during the week-end were rendered by the President (Galls and Arachnida), W. P. Winter (Arachnida), Rosse Butterfield and J. M. Brown (Entomology), Greevz Fysher (Mollusca), H. B. Booth (Vertebrate Zoology), A. Malin Smith (Flowering Plants and Ecology), Miss D. Hilary (Mosses), F. A. Mason (Fungi), E. Percival (Freshwater Biology). Hearty votes of thanks were accorded to the Local Secretary (Mr. Riley Fortune), to His Grace the Duke of Devonshire, K.G., LL.D., for permission to visit Grass Wood, and to Messrs. J. Crowther and W. Whitaker for their services as guides.

GEOLOGY (J. Holmes).—The writer and a few local members spent two days in the country north and east of Grassington, and along the banks of the Wharfe. The erosion of the river bed at Ghaistrills and at Linton Falls received attention, and a comparsion was made between the pebble beds in the river near Grass Woods, and those further down in the Millstone Grit area. The succession of the limestones from the

Great Scar to the Millstone Grit was traversed, and one of the east and west faults was followed to the old lead workings. Several crinoid heads were found, weathered out in a wall built entirely of crinoidal limestone. On Coniston Scars a fine leaf-shaped flint implement was found on a mound of earth excavated from a rabbit-burrow.

At Dibbles Bridge, *Productus maximus* was seen in profusion in the limestone, but good specimens were difficult to extract. In the quarry below the bridge, shales were seen resting upon the eroded surface of the limestone.

Following the course of Dib Beck across the Craven Fault to Dow Scar Nook, owing to the low state of the water the party was enabled to penetrate into the narrow gorge cut by the stream in the Hartlington 'knoll' for a considerable distance.

Several fossils were collected here, including *Goniatites crenistria*. Near Burnsall an exposure in the Bolland Shales was visited, and the zone fossils noted. *Goniatites sphæricus* was found in a quarry on the Burnsall Linton road.

FLOWERING PLANTS AND ECOLOGY (A. Malin Smith M.A.) :—The meeting proved a very successful one for the botanists. Almost all the plants in Mr. Beanland's list in the circular were found, the only significant omission being *Polygonum viviparum*, which it would have been a pleasure to find in this—its most southerly station. Notable additions were also made to the list. *Neottia nidus-avis* was found in Grass Wood under beech and hazel; *Antennaria dioica* and *Carlina vulgaris* on the upland calcareous pasture; *Selaginella selaginoides*, *Menyanthes trifoliata* and *Salix repens*, in a marsh by the stream flowing from Dib Scar. The most notable find of the visit, however, was *Orchis ustulata*, the Dwarf Orchid, an addition to flowering plant records for Grassington. It was as in its usual situation in calcareous pasture.

In Grass Wood there seems to be a serious diminution of *Serratula tinctoria* and *Helleborine atrorubens*, neither of which could be found, though formerly locally frequent. Mr. Whitaker, to whose guidance on the Monday the botanists were so much indebted, reports that *Viburnum opulus* is suffering to a marked extent from the repeated attacks of the aphis*, which has been so abundant on it during the last few years. Against these decreases there must be set the undoubtedly large increase in recent years of *Convallaria majalis*—a feature commented upon by all members present who knew the wood twenty or more years ago—and the firm, though local, establishment of *Actaea spicata*, *Aquilegia vulgaris*, *Polygonatum officinale*, of which several fine flowering groups were seen, and *Ophrys muscifera*, the quaint Fly Orchid. The *Aquilegia* was established as an inhabitant of the almost bare limestone screes on sloping ground, in a situation similar to that in which the lily-of-the-valley typically occurs.

Ecologically the outstanding fact about the Grassington area is that it is situated on limestone, and shows the typical characteristics of limestone vegetation. The rich and varied flora is such as only basic soils support, and is composed of an element limited to calcareous soils, the so-called calcicole plants, and, in addition, those plants which are of widespread distribution on all soils. The richness of the flora is also partly historical, as well as ecological, for here certain northern plants, such as *Actaea spicata*, *Primula farinosa*, *Polygonum viviparum* and *Sesleria caerulea* are either at or near the southern limit of their distribution, while a few southern plants, e.g., *Cornus sanguinea* and *Ophrys muscifera* are not far from their northern boundary. The characteristics of the limestone flora are strongly marked in both woodland as in Grass Wood, scrub as in Bastow Wood and in the grassland, but there are some exceptional features to be remarked, particularly in the woodland.

* *Aphis viburni* Scop. F.A.M.

Grass Wood is now, as to about 95 per cent. of its trees, a planted wood. The chief trees, Scotch Pine, Spruce, Larch, Sycamore and Beech are all introduced species, and are only maintained by careful forestry. The native trees in the wood are the Ash, *Fraxinus excelsior*, and the Oaks, *Quercus pedunculata*, and *Q. sessiliflora*. The shrubs—in particular the Hawthorn, the Buckthorn, the Spindle Tree, the Privet and the Burnet Rose—are those especially characteristic of ashwoods, and the characteristic ground vegetation of *Convallaria majalis*, *Rubus saxatilis* and *Melica nutans* is also typical of such woods. Although there is such a small amount of ash in the wood at present, we can safely conjecture from the shrub and ground vegetation that the chief tree of Grass Wood in its original natural state was the Ash. It is not probable on such thin, stony soil that it ever attained large dimensions. Mr. Whitaker stated that a diameter of about a foot was the maximum size attained by the Ash trees of Grass Wood, but that they yielded timber of excellent quality. We can probably safely conjecture that prior to planting, Grass Wood was dominated by Ash of moderate size, and was an open wood of a character verging on scrub, as are the natural woods higher up the dale. Its shrub and ground vegetation has probably altered little, though the recent spread of *Convallaria majalis* may have some relation to the denser shade of late years cast by the Spruce and Pine, which are now reaching maturity. This increased shading may check some of its competitors of the ground flora. This, however, is conjectural, and further study would be needed to find the cause of what is undoubtedly an interesting fact. The present year is a good one for Beech seedlings, but these do not establish themselves, the cause being that enemy of the forester, the rabbit, whose wholesale depredations in Grass Wood are only too evident. The gnawed bark of shrubs, and even the complete removal of the bark all round good-sized trees are signs of their destructive habits. Mr. Whitaker stated that the rabbits eat Ash seedlings much less frequently than they do Beech, and this may account for the possibility of natural regeneration of Ash, whereas such regeneration seems impossible with Beech in this area.

The scrub of Bastow Wood has a large proportion of *Betula tomentosa* and many trees of the *Salix caprea* aggregate. It is an interesting question whether it is progressive or retrogressive—probably the latter—though little change has been noted by those familiar with it for many years. It would be an interesting experiment, and valuable both from the point of view of botany and of forestry, if an area in Bastow Wood could be fenced off completely from rabbits, so that natural regeneration by seedlings could occur. Such an area might possibly produce in time much larger trees and become a true woodland. At any rate, the exact influence of the destruction by rabbits would be demonstrated.

Accounts of the ecology of Ash-woods, such as that given by Moss in his 'Vegetation of the Peak District,' scarcely prepare one for the abundance of the Primrose in Ash-woods in Wharfedale. It is described as occasional in ashwoods and rare to occasional in scrub on limestone, but here at Grassington it is nothing less than abundant, particularly in Bastow Wood, where also its hybrid with the cowslip is frequent. The almost complete absence of *Allium ursinum* in Grass Wood is another unusual feature, for in many Ash-woods it is dominant over large areas of the ground flora. Perhaps, however, the outstanding ecological feature of Grass Wood is the development in considerable areas of that typical Oak-wood association of the ground flora, Blue-bell, Bracken and *Holcus mollis*. The finding of the last-named grass in moderate quantity in some parts of the wood was important, for it is usually entirely absent in Ash-woods. This Oak-wood association is developed principally, though not entirely, under the coniferous trees, and it may be that the humus formed under them is somewhat more acid than that usually formed in Ash-woods. The slope of the ground is probably an important

factor in producing such variations of acidity. The presence of *Pyrola minor* under Beech is another fact pointing to somewhat acid conditions, as it is most at home in the acid humus of Pine-woods in non-calcareous soil. It would be interesting to take soil samples in the various parts of Grass Wood and see if determination of the soil acidity would help to explain these unexpected features of the ground flora. Other unusual features were the occurrence of *Polemonium caeruleum* on the dry rocky slopes of Dib Scar—it is usually listed for marshy places—and of *Primula farinosa* in very much drier situations than are characteristic of it. In the marsh by the stream flowing from Dib Scar the presence of *Salix repens* is worthy of note, as it is not usually found in a basic soil area, unless the soil has accumulated so as to be raised above the level of the basic ground waters, as, for example, at Austwick Moss. In those parts of the scrub and grassland where the soil is shallow were found a variety of typical limestone plants, e.g., *Helianthemum chamæcistus*, *Hippocratea comosa*, *Potentilla verna*, *Draba muralis*, *Thymus serpyllum*, *Alchemilla arvensis* and *Geranium lucidum*. The calcareous grassland above the woods was dominated by *Sesleria cœrulea* and *Fæstuca ovina*, among which the beautiful mountain pansy, *Viola lutea*, was plentifully scattered.

BRYOLOGY (Miss D. Hilary, B.Sc.) :—Grassington has been worked very thoroughly for Mosses and Liverworts in the past, and has always proved a rich district. In some respects, indeed, it is classic ground, for it was here that William West recorded the first Yorkshire station for *Hypnum virescens*. Unfortunately, the Grassington stations for several of the Mosses he recorded have been lost, and search has so far failed to reveal a trace of *Seligeria tristicha*, *Zygodon gracile* and *Orthotrichum rufescens*, which he reported there. On the other hand, several species, apparently not previously reported for Grassington, were seen by the various members of the Bryological Committee present. These are *Bryum inclinatum*, *Thuidium recognitum*, *Ditrichum flexicaule* var. *densum*, *Hylocomium rugosum*, *Pleuridium rubulatum* and the Liverworts *Cololejeunea rossettiana* and *Lejeunea cavifolia*, the latter being in great quantity at Dib Scar. *Lejeunea calcarea*, which was also found in small quantity, had previously been reported by West.

The following is the complete list of Bryophytes seen by the various members during the week-end :—

MOSSES.

<i>Bryum inclinatum</i> .	<i>Pleuridium subulatum</i> .
<i>B. capillare</i> .	<i>Plagiothecium denticulatum</i> .
<i>B. cæspiticium</i> .	<i>P. sylvaticum</i> .
<i>Hypnum protensum</i> .	<i>P. undulatum</i> .
<i>H. commutatum</i> .	<i>Amblystegium confervoides</i> .
<i>H. cypresiforme</i> var. <i>tectorum</i> .	<i>A. filicinum</i> .
var. <i>filiforme</i> .	<i>Eurychium crassinervum</i> .
var. <i>ericetorum</i> .	<i>E. murale</i> .
<i>H. molluscum</i> .	<i>E. striatum</i> .
<i>H. palustre</i> .	<i>E. praelongum</i> .
<i>H. myosuroides</i> .	<i>Brachythecium purum</i> .
<i>H. cuspidatum</i> .	<i>B. populeum</i> .
<i>H. schreberi</i> .	<i>Camptothecium sericeum</i> .
<i>Hylocomium splendens</i> .	<i>Thuidium recognitum</i> .
<i>H. loreum</i> .	<i>T. tamariscinum</i> .
<i>H. squarrosum</i> .	<i>Tortula muralis</i> .
<i>H. triquetrum</i> .	<i>T. intermedia</i> .
<i>H. brevirostre</i> .	<i>Barbula rubella</i> .
<i>H. rugosum</i> .	<i>B. recurvifolia</i> .
<i>Funaria hygrometrica</i> .	<i>Trichostomum mutabile</i> .
<i>Catherinea undulata</i> .	var. <i>lophocarpum</i> .
<i>Polytrichum formosum</i> .	<i>T. tortuosum</i> .

Rhacomitrium lanuginosum.
Ditrichum flexicaule.
 var. *densum*.
Swartzia montana.
Ceratodon purpureus.
Dicranum majus.
Dicranum scoparium.
Fissidens pusillus.
F. decipiens.
F. bryoides.
F. taxifolius.
Grimmia apocarpa.
G. pulvinata.
Dicranoweisia cirrata.
Dicranella heteromalla.

Campylopus flexuosus.
Mnium hornum.
M. undulatum.
M. punctatum.
Neckera crispa.
N. complanata.
Porotrichum alopecurum.
Anomodon viticulosus.
Leskeia polycarpa.
Encalypta streptocarpa.
Orthotrichum cupulatum.
O. anomalum.
 var. *saxatile*.
Webera nutans.
W. cruda.

HEPATICS.

Conocephalum conicum.
Pellia epiphylla.
Metzgeria pubescens.
Lophozia ventricosa.
L. quinquentata.
Gymnocolea inflata.
Lophocolea heterophylla.

Plagiochila asplenoides.
Lepidozia reptans.
Porella platyphylla.
Cololejeunea Rosettiana.
Lejeunea calcarea.
L. cavifolia.

MYCOLOGY (F. A. Mason).—The work of members of the Mycological Committee was greatly assisted by the efforts of members of the Plant Galls Committee, and a good quantity of material attacked by Uredines and other leaf fungi was brought in by the President, Messrs. J. M. Brown, W. P. Winter and Miss Pilkington. Miss D. Hilary, as will be seen from another report, had her collecting energies diverted into another channel, with benefit to the Bryologists. The late season renders it still early for many of the rusts and smuts which are certain to be found in Grass Wood a little later, as may be deduced from signs of incipient attack, shown by discoloured areas on the leaves of plants collected by the Galls people. The severest infestation of any one of these fungi was that by *Ustilago violacea*, which produces its sori in the anthers of *Lychnis diurna*; the dusky-violet colour of the anthers, and generally sickly appearance of the petals, renders the presence of this fungus conspicuous, and in an area of considerable size, near High Gregory. I endeavoured to find a single plant remaining unattacked without success. The following species were noted, and those in the first list were commonly and widely distributed. Except when otherwise stated, they occurred in Grass Wood.

- **Uromyces geranii* Otth et Wart. on *G. sylvaticum*.
- **U. alchemillæ* Lév. Uredospores on *A. vulgaris*.
- **U. ficariae* Lév. Teleutospores on *R. ficaria*.
- U. scillarum* Wint. Teleutospores on *S. nutans*.
- **U. poæ* Raben. Æcidia on *R. Ficaria*.
- Puccinia Leontodontis* Jacky. Teleutospores on *L. hispidus*.
- P. variabilis* Grev. Æcidia on *Taraxacum officinale*.
- P. hieracii* Mart. Uredospores and teleutospores on *H. pilosella*.
- **P. betonicae* DC. On *B. officinalis*.
- **P. saniculae* Grev. Æcidia, uredospores and teleutospores on *S. europaea*.
- **P. tumida* Grev. Uredospores on *Conopodium denudatum*.
- **P. violæ* DC. Æcidia on *V. riviniana*.
- **P. caricis* Reb. Æcidia on *Urtica dioica*.
- **Triphragmium ulmariae* Wint. Uredospores on *S. ulmaria*.
- **Phragmidium mucronatum* Schlecht. On *Rosa spinosissima*.
- **Melampsora rostrupii* Wagner. Cœomata on *Mercurialis perennis*.
- **Urocystis violæ* Fischer. On *V. riviniana*.

Several species of the so-called mildews were also collected from leaves of living plants. These were :—

Peronospora Violare De Bary. On *V. Riviniana*.

Peronospora sparsa Berk. On *Rosa spinosissima*.

Podosphaera oxyacanthae De Bary. On *Crataegus oxyacantha*.

Sphaerotheca pannosa. On cultivated roses in Grassington.

Very few agarics were noted. *Galera hypnorum* was abundant in the damper mossy places, where also occurred the variety *swartzii* of *Omphalia fibula*. *Stropharia merdaria* and *Psathyra corrugis* were not uncommon on Lea Green. Two species new to Mid-west Division (V.C. 64) were identified ; these were a tiny, pellucid, agaric, *Collybia muscigena* (Schum.) Fr., found on a mossy stump, and *Mycena inclinata* Fr., handed to me by Mr. Rosse Butterfield.

Polypores were strikingly absent. Mr. Butterfield tells me that *P. Rostkovii* occurs in the wood, but no specimen was seen on this occasion.

Several of the smaller Discomycetes were collected, and the best of these was *Ascobolus carbonicola* Boud., of which a very fine gathering was obtained from a circular patch of charred soil and finely-divided wood charcoal. This also is a new record for the Division. The fungus is of a rich brown colour, beautifully crenulate at the margin and scurfy below the disc, a delightful object for microscopical study. The woodman who accompanied me when this find was made remarked that he had been acquainted with such burnt patches all his life, and "would never have believed" that such a thing would grow on them. Other Discomycetes were :—

Helotium herbarum (Pers.) Fr.

H. fractigenum (Bull.) Fuckel.

Calycella citrina (Hedw.) Boud.

Mollisia cinerea (Batsch.) Karst.

M. melaleuca (Fr.) Sacc.

Dasyphypha nivea (Hedw. fil.) Sacc.

Trichoscypha calycina (Schum.) Boud.

all of which are species, common on fallen branches, the last-named fungus being the causative agent of the Larch Canker disease.

Several Pyrenomycetes occurred, and among these were :—

Melanomma pulvis pyrius (Pers.) Fuckel.

Diatrypella quercina (Pers.) Ces. et De Not.

Xylaria carpophila (Pers.) Hill.

Those fungi in the first list marked with an asterisk are the species noted by Mr. Falconer as 'gall producers' for the purposes of the Plant Galls Committee's records ; to those should be added *Phragmidium fragariastri* Schröt., which produces malformations in the stems and leaves of *Potentilla Fragariastrum*.

PLANT GALLS (W. Falconer).—Although plant galls require growing tissues for their development, the vegetation, owing to the late season, was not sufficiently advanced for any great variety of these formations. Those due to fungi were the most in evidence, examples being found on the lesser celandine and wood violet, two species each, and on betony, sanicle, earthnut, common nettle, meadow sweet, barren strawberry, spinous rose, dog's mercury and lady's mantle, one species each. The names are not repeated, as they are asterisked in Mr. F. A. Mason's list of fungi. To him also I am indebted for their correct naming. Galls due to greenflies were widespread, abundant and often harmful to their hosts.

Chermes (old) ? species, on spruce.

Aphis padi Linn. on bird cherry.

A. viburni Scop., on guelder rose.

Psylla buxi Linn., on box (hotel).

Those due to mites were in their early stages and also in plenty.

Eriophyes avellanæ Nal., 'big bud,' on hazel, especially prevalent.

E. padi Nal., on bird cherry.

E. pyri Pgnst., on mountain ash.

Phyllocopis gymnaspis Nal. on veins of sycamore leaves. Dipterous and hymenopterous galls were conspicuous by their absence, but Master Harold Mason found an old one not yet identified on the spinous rose. Seven members of the Plant Galls Committee assisted in the investigation, but Tuesday spent alone enabled the writer to add to the above list the greenfly gall *Myzus ribis* Linn. on gooseberry and the mite galls *Eriophyes ribis* Nal., the 'big bud,' on black currant bushes in the village, and *E. gonoiothorax* Nal., on hawthorn, *E. similis* Nal. on blackthorn, and *E. rufidus* Can. var. *longiseta* Nal. on birch, and the dipterous gall *Massalongia rubra* Kieff also on birch in Dib Gill.

VERTEBRATE ZOOLOGY (H. B. Booth):—An enjoyable meeting was well attended by members of this section.

Among mammals, a single British Squirrel was seen, where formerly it was quite common. The Water Vole was noted by the river, and the Common Rat was much in evidence at the Grassington sewage beds.

Grass Woods (including Bastow Wood), are glorious, and should be delightful places for most of the British warblers. But it has long been a puzzle to local ornithologists why these birds are so sparsely represented, with the single exception of the Willow Warbler, which abounds. Among the birds noted sparingly in Grass Woods were the Wood Warbler, Garden Warbler, Common Whitethroat, Goldcrest, Spotted Flycatcher, Cuckoo, Tawny Owl, and Woodcock. On the moor above were Curlews, Golden Plovers, Lapwings, Ring Ouzel and Wheatear. The riverside, and more especially the Ghaistrills, or 'Grassington Strid,' is particularly good for the observation of bird life. Here, on a length of less than half a mile, may conveniently be seen the three species of British nesting Wagtails, three species of British Swallows, and the Swift. Also the Tree Pipit, Dipper, Common Sandpiper, etc.

Rather curiously all the numerous Lapwings' nests seen contained eggs, while a few miles further down the valley they had hatched quite a month before. The late W. H. Parkin first drew attention to the number of sucked egg-shells to be seen near the top of Dib Scar—including those of Woodcocks, Lapwings, Golden Plovers, etc. Mr. Parkin was inclined to lay the blame chiefly on a family of Carrion Crows; but I am inclined to the belief that the Jackdaws in Dib Scar are the chief sinners. A curious find was a Lapwing's nest with five eggs, in an isolated position, and by the very elongated eggs, evidently all laid by the same bird. A Garden Warbler's nest with four eggs was seen.

The report that the Black-headed Gulls were nesting on the Grassington sewage beds proved to be incorrect.

Of reptiles, a Slow-worm was captured, and Mr. Crowther exhibited more than a dozen local specimens in a jar of spirit. Mr. Rosse Butterfield pointed out that Viviparous Lizards seen on the moor were of a greyish tint, due, no doubt, to their long environment on the mountain limestone rock.

MOLLUSCA (Greevz Fysher).—As there was a plentiful downpour of rain during two or three of the nights of the Grassington Excursion, land mollusca were fairly active, and the following have been observed by Mr. John W. Taylor, M.Sc., in the gatherings which were obtained with the assistance of Mrs. and Miss Morehouse:—*Arion ater* juv., *A. subfuscus*, *A. circumscriptus*, *Limax arborum*, *Hyalinia cellaria*, *H. radiatula*, *H. alliaria*, *Helix nemoralis*, *H. hortensis* Dib Scar., *H. arbustorum*, *H. lapicida*, *H. striolata*, *H. hispida*, *H. rotundata*, *H. rufestris*, *Bulinimus obscura*, *Pupa umbilicata*, *Clausilia laminata*, *C. bidentata*, *C. cravenensis*, *Zua lubrica*, *Limnea peregra* and vars. *lacustris* and *acuminata*, *Ancylus fluviatilis*.

ENTOMOLOGY : LEPIDOPTERA, etc. (R. Butterfield) :—Most of the familiar early June butterflies and moths were apparently absent in the woods at Grassington on account of the lateness of the season. Mr. G. Bennett obtained in Bastow Wood *Lobophora viretata* on Whit Monday. It has been recorded but once previously, in June, 1891, and it is a scarce species in the County. The larva is said to feed on *Actaea spicata*, privet, etc. Among other species were *Venilia maculata* (not uncommon), *Venusia cambricaria*, *Eupithecia lariciata*, *Odontopera bidentata*, *Cidaria corylata*, *Asthenia candidata* (common), *Abraxas ulmata*, *Melanthis albicillata*. Of the Micro-lepidoptera *Tortrix ministrana*, *Scoparia basistrigalis*, and a *Tortrix* likely to be new to the County.

DIPTERA :—*Microdon mutabilis* was not seen at large, but flies have emerged since from pupae secured by two or three members.

HYMENOPTERA :—Few Aculeate Hymenoptera were seen. *Nomada bifida*, *N. alternata* and *Andrena albicans* being the only species among the solitary bees, and *Bombus latreillellus*, *B. hortorum*, *B. pratorum*, *B. soricensis* and *B. venustis* of the social bees.

The saw-fly *Rhogogaster viridis* was common, the large species captured by Mr. J. Beanland, probably *Cimbex femorata*, has not been previously recorded for the immediate district.

OTHER INSECTS (J. M. Brown, B.Sc.).—Insects of remaining groups were not abundant on this occasion, the cold and dry weather of the preceding weeks having kept them back.

Of the Thysanura, two species were seen, *Præmachilis hybernica* occurred among the loose stones below Dib Scar, and *Campodea staphylinus* in several places. Few Collembola were noticed, the most interesting being *Bourletiella insignis* taken in the damp meadow below the Scar, while *Entomobrya nivalis*, *Isotoma viridis* and *Orchesella cincta* were fairly common.

Of the Coleoptera, the most obtrusive were weevils of the genus *Phyllobius*, *oblongus* and the brilliant green *urticæ* and *viridieris*, while *Cidnorrhinus quadrimaculata* was very abundant on nettles. A few ground beetles were noticed, the best being *Cychrus rostratus* taken under a stone below Dib Scar. *Phytodecta pallida* and *Chrysomela varians* were swept from vegetation, and *Podabrus alpinus*, *Telephorus nigricans* and *pellucida*, *Rhagonycha limbata* and *Malthodes marginata* were fairly common. *Silpha atrata* and the var. *brunnea* were taken under stones, and *Melolontha vulgaris* was unfortunately far too plentiful.

Very few Heteroptera, and more remarkable still, very few immature specimens, were to be obtained. *Drymus sylvatica* was taken beneath a stone, and *Salda C-album* occurred in damp places below the Scar. On the stones by the river side many immature *Salda* were seen, these possibly were *S. scotica*, which occurs in a similar situation in Wensleydale. *Anthocoris confusus* and *nemorum*, and a single *Miris holsatus* were swept from vegetation.

Of the Homoptera, *Thamnotettix prasinus* and *subfusculus*, *Cixius nervosus* and *cunicularius*, the last emerging from beneath stones, were taken.

Of the Panorpids, *Panorpa germanica* was common, but *communis* was not seen.

Two peculiar cases of mutilation were noted, in both cases with beetles. Specimens of *Phyllobius urticæ* and *Melolontha vulgaris* were observed with the whole of the contents of the abdomen missing, apparently having been pecked away by birds. Both insects were still alive, in fact the latter was first noticed crawling along the roadway.

A 'dew-pond' near the top of Dib Scar was noted by several members as being particularly full of animal life. Besides tadpoles innumerable, water-beetles and water-boatmen (*Corixa geoffroyi*, *limitata*, *nigrolineata* and *præusta*) were abundant, while leeches (*Clepsine*), carrying their young, swarmed on the bottom, and hosts of water-fleas (*Cyclops* and

Daphnids) imparted a distinct colour to the water. The species of these latter have not yet been worked out. It was particularly noted that vegetation appeared to be almost absent.

ARACHNIDA (W. Falconer).—The two members of the Arachnida Committee present for the first three days accompanied the general body of naturalists through Grass and Bastow Woods, but the amount of walking and ground covered which this entailed did not permit of any large gathering, spiders being few in number and in species. One new to the district, *Centromerus arcarius* Cb., was obtained in the first named wood, and although rather early to obtain adult *Micrommata virescens* Clerck., Mr. J. M. Brown shook a juvenile example from hazel. Beneath stones on all the routes, alike in the woods and on the hillsides, *Coelotes atropos* Walck. (females adult and immature) was abundant; in similar situations on the more open high grounds amongst hazel scrub, *Zelotes latreillei* C. L. Koch was taken in its old locality in Grass Wood, and in two new ones in Bastow Wood. In several places the distinctive eggsacs of *Evansia merens* Cb. were seen on the under surface of the stones covering ants' nests, but not the spider itself. Working Dib Gill alone on the Tuesday in circumstances which allowed a more leisurely and closer search gave better results, four species new to the Grassington area being shaken from moss, viz., *Porrhomma montanum* Jacks. ♀, *Metopobactrus prominulus* Cb., ♂, *Diplocentria rivalis* Cb., ♀, and *Hahnia pusilla* C. L. Koch, ♀. The last named is the third Yorkshire example, the other stations being Hebden Bridge and Sawley High Moor. It has occurred also at Abergele (N. Wales), but seems only to flourish in Delamere Forest, where it was first discovered as British in 1906. Three kinds of harvestmen were observed, but the mites will require a longer time to identify. The names of those not mentioned above are given below, and probably as Mr. Winter's list has not come to hand, others may have to be added to complete the total.

SPIDERS :—

Woods—

- Amaurobius fenestralis* Stroem, ♀.
- Pocadicnemis pumila* Bl., ♂.
- Diplocephalus fuscipes* Bl., ♀s.
- Macrargus rufus* Wid., ♂, ♀.
- Leptyphantes peltata* Wid., ♀s.
- Bolyphantes alticeps* Sund., ♀.
- Meta segmentata* Clerck, several.
- M. merianae* Scop., ♀.
- Lycosa pullata* Clerck., ♂s, ♀s.
- L. amentata* Clerck., ♀s.
- Xysticus cristatus* Clerck., imm.

Open Fields—

- Poeciloneta globosa* Wid., ♂, ♀s.
- Textrix denticulata* Oliv., ♂, ♀.
- Trochosa terricola* Thos., ♀s.
- Lycosa pullata* Clerck., ♀s.
- L. palustris* Linn., ♀s.

HARVESTMEN :—

Woods—

- Mitopus morio* Fabr., many.
- Nemasistema lugubre* Müll., ♀.
- Megabunus diadema* Fabr., ♀s, Dib Gill.

(To be continued).

—:o:—

In *Nature* for April 23rd, the Director of the Municipal Museums at Hull replies to a criticism recently appearing in that journal relating to the Mortimer Museum of Prehistoric Antiquities at Driffield.

NEWS FROM THE MAGAZINES.

An account of the Wellcome Historical Medical Museum, by E. N. Fallaize, appears in *Man* for June.

R. T. Jackson describes 'A method of mounting Fossils on plaster backs' in *The Museums Journal* for May.

J. E. Nichols describes Corriedale Sheep in Great Britain, in *The Journal of the Ministry of Agriculture* for June.

The Coleopteron, *Atheta aquatalis* Thoms., is recorded from Hayburn Wyke and Forge Valley, in *The Entomologist's Monthly Magazine* for June.

The Editors of *The Naturalist* will be glad to receive Field Notes containing new or important records relating to the northern counties.

Excellent illustrations of the One-sheaked Hawk, the Harpy Eagle, and the Barnard's Parakeet (*Barnardius crommelineæ*), the last coloured, appear in *The Avicultural Magazine* for June.

Dr. S. Graham Brade-Birks sends us some 'Notes on Helminths I.: Some Parasites of Domestic Animals in South-Eastern England,' from *The Journal of Helminthology* for March. His researches have been largely carried out in the Agricultural College at Wye in Kent.

The Colliery Guardian for May 20th contains a report of Prof. P. F. Kendall's evidence before the Commission on Drainage, dealing with the Doncaster Drainage Commission, and the extent of the Yorkshire, etc., Coalfield. Contributions to *The Naturalist* are quoted in this report.

In *The Journal of the Imperial Fisheries Institute* (Japan), H. Seno and J. Hori describe 'a new method of the fattening of oyster.' They point out that 'oysters are grown with extreme rapidity by being freely hung in the water' instead of being allowed to accumulate on the sea floor.

In *The Scottish Naturalist*, No. 164, Mr. H. B. Booth corrects a record of an alleged large fox, recently appearing in that journal. It was stated that a fox 28 lbs. 14 ozs. in weight was killed near Keighley in 1916, but, as was recorded in *The Naturalist* at the time (1916, p. 173), 'the story was a pure concoction.'

C. L. Bolton deals with the difficult question of the 'Origin of various tribes of Kenya'; I. Q. Orchardson on 'The Origin of the Masai'; M. F. R. Hockliffe describes 'An Elephant Tragedy'; and G. W. B. Huntingford 'On the History of the Nandi till 1820,' in *The Journal of the East Africa and Uganda Natural History Society* for January.

Part I. of *The Countryman*, 'An illustrated Review and Miscellany of Rural Life, edited in the Country and written by countrymen and countrywomen throughout the World, issued by Idbury Kingham of Oxford,' at 2s. 6d. quarterly, has made its appearance, and is a charming publication of 88 pages. It contains a variety of subjects, such as: Villages as Museum Pieces; The Collector; The Trees we Might Have, by the Rt. Hon. Sir Francis Acland; New Rural Tales, etc.

—: O :—

Thysanoures, Dermaptères et Orthoptères, France et Faune Européenne. Tome Second, par le Professeur C. Houlbert, 357 pages, avec 46 figures dans le texte et XV. planches, 32 fr., Librairie Octave Doin, Paris. This volume of the Bibliothèque de Zoologie section of the remarkable Encyclopédie Scientifique deals with the Cockroaches, Mantids, Stick Insects, Grasshoppers and Crickets of Europe. It includes in a very compact form keys and descriptions serving for the identification of the Orthoptera of the European fauna. The illustrations are clear and draw attention to essential details of structure. To students of this group of insects the book will be of great service. Messrs. Gaston Doin et Cie are to be congratulated on issuing this series of cheap volumes on neglected groups of insects, etc. One feels, however, that works of this kind should have a better binding than a stiff paper cover.

NORTHERN NEWS.

Dr. J. W. H. Harrison has been appointed Professor of Botany at Armstrong College, Newcastle.

Sir James Roberts has presented Haworth parsonage to the Bronte Society for use as the Bronte Museum.

Mr. Stanley Baldwin has been elected a trustee of the British Museum in place of the Duke of Bedford, who had resigned.

The death is announced of Dr. James Mitchell Wilson, late medical officer of health for the East Riding, at the age of 83.

In a contemporary, Sir Oliver Lodge writes: 'a peculiar trouble noticed in connexion with lamps and valves seems to indicate a possible explanation for the cause of cancer.'

The Ministry of Agriculture and Fisheries has issued *Sea Fisheries Statistical Tables*, 1926 (H.M. Stationery Office, 51 pp., 2/6 net), which demonstrate the extraordinary importance of this business.

From the press of June 3rd we find that 'A grampus has been washed up in the Ouse near Howdendyke. It was "about 16 feet in length, and its estimated weight one ton. Its tail, which was nearly five feet across, has been severed by souvenir hunters."

A correspondent in the *Yorkshire Post* is inviting people to go to Kettlewell, to see square walls for pigs, and round ones for men, erected by the Brigantes. It would be interesting to know what scrap of evidence there is that the works are of the date named and why pigs should have square walls and men round ones.

We learn from *The Daily Mail* that buttercups and daisies growing on one stem have been picked by a schoolgirl in a field at Newton Nottage, Glamorgan. We are sorry to doubt *The Daily Mail*, but we don't believe it! The record is under the heading 'News by Wire, Air and Wireless.' Possibly it arrived by Air!

The Northern Echo for April 29th contains illustrations of what is said to be a flint spear head found in Darlington, and the definite opinion is expressed that the spear head is Palaeolithic. Judging from the drawings we are inclined to think that the 'implement' is a natural fracture, and in any case it is very unlikely to be a paleolithic spear head, but possibly some day someone will get the opinion of an expert. It is a pity this was not done before illustrations and descriptions were printed.

We learn from the Press that 'a water diviner was sued recently for £1000 damages for failing to provide a water supply for Biarritz. He, however, won his case, as the Court held that he could not be sued for damages any more than a doctor who failed to cure a patient could be sued. The action was brought by Mme. Hazard and her son, who hold a concession for the water supply of Biarritz, and engaged Dr. Moineau to find further sources of supply. His fee was to be £100 and so much per cubic foot of water provided. He failed to find any fresh source of supply.'

Mr. F. J. Brown, Assistant Lecturer in Zoology at the Leeds University, favours us with a reprint of his paper on '*Crepidostomum farionis* O. F. Müll (= *Stephanophiala laureata* Žeder), a Distome Parasite of the Trout and Grayling,' which appears in *Parasitology* for March. The species inhabits the gall bladder and intestines of the trout and grayling. Apparently the trematode first exists in *Pisidium amnicum* (Müll) and *Sphaerium corneum* (L.), though the latter is unusual. The second intermediate host is the larva of the mayfly, *Ephemera danica* (Müll).

We learn from the press that two urns, presumably of the Bronze Age, have recently been found in a sandpit near Carlisle. We also gather that 'one is perfect, and is undoubtedly one of the finest specimens ever found in this country.' This particular expression relating to prehistoric vases found in the north of England during the past few years is getting rather monotonous, and obviously is written by a reporter who clearly knows nothing about the subject. There are, of course, dozens of much finer examples. That the opinion is not given by an expert is shown by the statement that 'experts will be called in to examine them.'

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T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums Hull;

and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

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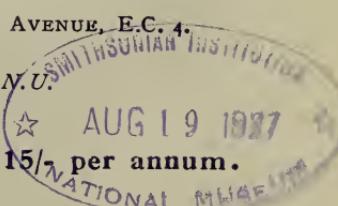
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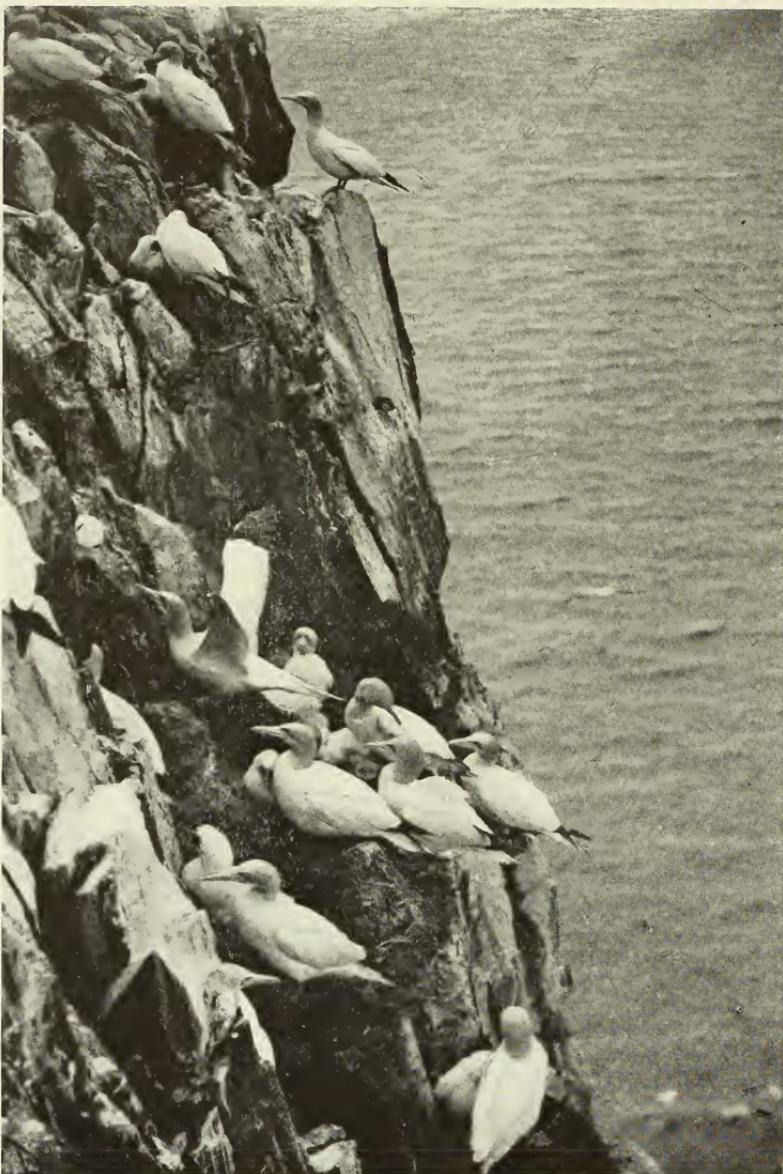
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BIRD LIFE.*

We have long recognised Mr. Coward as an authority on the British Avifauna. In this book he shows that his observations are not insular, and in a series of charming chapters he tells of the feathered friends he has made in many far-off countries—France, Holland, the Pyrenees, and so on. His stories of the rarer birds in these areas are written with authority, and made all the more interesting by the reproductions of several beautiful photographs. Mr. A. Thorburn also contributes a coloured frontispiece, 'Flamingoes at Home.' One of the illustrations we are kindly permitted to give as Plate VIII.

BEGINNING AGAIN !

Sir Frederic Kenyon, Director of the British Museum, delivering the Romanes lecture at Oxford recently, on the subject of 'Museums and National Life,' made sarcastic allusion to persons of a revolutionary tendency, whether in politics or in art, who decry the monuments of the past. 'Not very long ago,' he said, 'in the welter of unsettlement caused by the war, when standards seemed to be overturned and anchors could find no firm holding-ground, a gentleman of foreign extraction earned temporary notoriety by advocating the destruction of all picture-galleries and museums, and I believe of all books also, in order that the unfettered mind of man might make a fresh start. In the same spirit some of our guides in taste have urged us to seek inspiration from the untutored products of Central Africa rather than from Greece or Italy. It is an alluring doctrine, and might have wide applications. The gourmand should be advised to begin again with tripe and onions, the dandy should revert to woad, the soldier to the flint axe, the artist to pictographs designed on the wall of a cave by the light of a smoky torch. All inequalities would be wiped out, we should all start again from scratch, and—future ages would see what they would see.'

A NEW LEEDS MUSEUM.

We learn from *The Yorkshire Weekly Post* that: 'The dwelling-house embodying the ancient gatehouse of Kirkstall Abbey, which has come into the possession of the Leeds Corporation as the outcome of a benefaction by the late Colonel J. T. Harding, was on Monday, July 11th, formally opened to the public as a museum. The building has, under the direction of Mr. H. Crowther, Curator of the Leeds City Museum, been fitted with cases, and a very interesting collection of antiquities has been brought together. Some of these are

* 'Bird Life : at Home and Abroad, with other Nature Observations,' by T. A. Coward, M.Sc., F.Z.S., M.B.O.U. London : F. Warne & Co., 242 pp., 7/6 net.

from the little museum which has long existed within the grounds of the Abbey, but the greater part are from the almost inexhaustible stores in the City Museum itself. It is the intention of the Museums Committee that the building shall remain open to the public at a charge of one penny during the same hours each day that the City Museum opens its doors.' This charge of one penny per head is puzzling. Surely if the museum is of value educationally, the more people who visit it the better? Then why keep people away by making a charge? If, however, it is on the basis of the old Dime Show, all well and good. But we ought to look to Leeds to lead. No charge is made to enter the Public Library nor the Art Gallery there!

LINCOLNSHIRE BRONZE-AGE POTTERY.

In the *Fifth Annual Report of the Grantham Public Library and Museum*, Mr. Henry Preston gives illustrations of three Bronze-age vessels resembling each other very much in general shape, though varying slightly in size and decoration. Of these he says: 'Our collection of Early British Pottery is of considerable interest and educational value. Perhaps the one vessel which stands out most prominently in interest is a rather large Bronze-age food vessel, which has been used to hold bones from a cremated body. Its interest lies in the fact that when the early Kelts changed their practice from burying the dead body to cremating it, the first cinerary urn used was an enlarged food vase, and not the turned-down rimmed one. It will be seen, therefore, that our enlarged food vessel (about twice the capacity of an ordinary food vessel), is the connecting-link in our collection between the two methods of disposing of the dead body.' (See p. 219.)

THE BOSTON MUSEUM.

The following letter appeared in *The Yorkshire Post* recently, under the initials 'E.H.B.': 'The Municipality of Boston, Lincolnshire, has a unique, and many will consider an unenviable, record for the severity of the restrictions which it imposes upon the hours of admission of the public to its museum and art gallery. Its collection is in the Municipal Buildings, where the public library is also housed, but a plate alongside the entrance to the museum reads "Borough of Boston, Pictures and museum on view between 2 and 4 p.m., Saturdays and Sundays excepted." Thus, the collection is only open for ten hours a week, and is closed on Saturday and Sunday afternoon, when the workers would have the best and fullest opportunity of taking advantage of its influence, educationally and artistically. I cannot say anything as to the value of the collection guarded so jealously, for I have not been there and free between the hours of two and four on the



Bronze-age Food Vessels from Lincolnshire.

five afternoons of the week that it is open to the inspection of the public. All I can say is that it is enough to make "the Stump"—the famous tower which rises loftily from the ancient Parish Church—bow its head with shame.'

MAGAZINES AND NATURAL HISTORY.

Ours, the house magazine of Messrs. Reckitt & Sons, of Hull, is one of several which are issued by different firms



Photo by]

Thornwick Bay, near Flamborough.

[H. Teale.

for the benefit of their staffs. In *Ours*, besides an enormous number of illustrations more or less connected with the firm and its business, there are articles of general interest dealing with natural history, geology, archaeology and so on. In the July number are several photographs, one of which is reproduced herewith, and the subject will be familiar to our readers.

THE BIRDS OF EAST YORKSHIRE.*

T. SHEPPARD, M.Sc., F.G.S.
(*Director of the Hull Museums.*)

I should like to draw attention to the extraordinary wealth of bird life to be met with on the coast of the broad-acred shire, where three important bird sanctuaries exist, each one having peculiarities of its own and differing from the others.

The well-known precipitous cliffs of Bempton and Flamborough harbour Guillemots, Razorbills, Puffins and birds which usually lay one egg on a ledge and hatch the young one therefrom. The south-east corner of the county is a magnificent sand tract of Spurn Point where a totally different aspect of sea bird life thrives, which brings its youngsters up in nests made in holes in the sand.

Between the two is Hornsea Mere, where the secluded woods and the protection afforded by the landowners entice certain Grebes and other interesting species to breed.

Thus, in the three sanctuaries, quite a good proportion of the important birds of the British Islands may be seen at one time or another.

The Yorkshire Wild Birds and Eggs' Protection Committee contributes funds for the payment of watchers in each of these areas, who, during the breeding season, do their best to prevent wanton destruction among the birds and their eggs.

Unfortunately, we cannot claim absolute sanctuary for the birds in either of these areas, and each of them is visited by trippers and others, who do harm more by thoughtlessness than by anything else; but by the aid of watchers, financed by the Yorkshire Society, the damage to bird life is considerably lessened.

Perhaps the most interesting of the areas is that of Spurn Point, which has been a bird paradise for a considerable time, possibly aided by the powerful lighthouse, the beams from which attract large quantities of migrating species. The isolated sandbank at Spurn has produced an enormous number of rare forms at one time and another. Birds arriving into this country in the Spring migration, or departing from it in the Autumn, assemble at Spurn.

The lighthouse is an attraction, and a powerful light at night seems to have a fascination for birds of passage, some even dashing themselves against the glass in their anxiety to get near the light, many being killed in this way. In recent years, however, through the efforts of the local naturalists, the lighthouse has had placed upon it a large number of perches upon which the birds can rest.

* This is one of a series of B.B.C. talks to scholars, dealing with the natural history of East Yorkshire, which we have been asked to print.

Unfortunately, during the War, many drastic changes had to be made in this otherwise secluded region, and species which ordinarily bred there in great numbers were disturbed, and in some instances disappeared. However, the district is still one of the few breeding colonies of the beautiful Sea-Swallow, or Lesser Tern; the Ringed Dotterel, and other rare birds, while occasionally the Oyster-Catcher and similar interesting forms are known to nest here.

Formerly, great destruction occurred among the eggs by trippers from Grimsby and other places, who deliberately threw them about or threw stones at them, and, in addition, a certain amount of harm was done by indiscriminate collectors who gathered the eggs in large numbers for sale. Now a paid watcher does his best to prevent this destruction, and the eggs are marked with indelible ink so that they cannot very well be sold without detection.

Probably in no part of England is the question of protective coloration as applied to both birds and their eggs, so pronounced as on the Spurn Peninsula. I have seen within a small area twenty or thirty different clutches of eggs of the Lesser Tern, and yet a stranger unfamiliar with the eggs would probably not see a single one, in fact I have been with parties when members have actually trod upon the eggs before realising what they were doing. The bird does not make any nest, as usually known, but merely scoops a slight hollow in the sand. Its eggs are precisely the colour of the sand, and are spotted with brownish markings so as to resemble the small pebbles which occur there. In this way the eggs are like their surroundings, and are not conspicuous. Apart from the efforts of man, there are a number of birds such as Magpies, Crows, Jackdaws, etc., always ready to steal and eat eggs of this description, so that their similarity to the sand prevents their ready detection.

But even a more striking example occurs in the young birds themselves. So soon as they are hatched, they resemble little balls of fluff, again spotted and streaked to resemble sand. The last time I was at Spurn with a well-known Hull man, we walked along the sands toward the Point, and I showed him a single chick of a Lesser Tern. This was running about on the sands some distance away, but on a warning note from the parent birds flying above, it immediately squatted down at full length and remained absolutely motionless. I pointed this bird out to my friend, who failed to see it, and we walked quietly and slowly towards it, but he could not see it at a distance of two or three feet. I then very quietly stooped down and picked the bird up in my hand, it making no attempt to get away. It was of course immediately released, and we left it to be joined by its parents. This illustrates the extraordinary way in which these birds are naturally protected.

Quite apart from the ordinary species which one meets with in a place of this character, occasional rare forms arrive, even Flamingoes, Great Bustards and other semi-tropical birds being recorded, and I much regret to say, frequently have been shot. However, in recent years, there has been a great change among naturalists with regard to our wild birds. Formerly a naturalist was more after the manner of a collector, and delighted in surrounding his walls with all the rare species of birds he could possibly shoot. To-day he takes more pleasure in watching the birds through powerful telescopes, or in photographing them, or even in taking cinematograph films, than in killing them ; the result is our knowledge of birds is considerably increased, and to-day large collections occur in museums only, where they can be referred to by those interested. In the Museum at Hull, quite apart from many interesting foreign forms, there is nearly a complete series of all the British breeding birds, in many instances both male and female and in some instances with the chicks, mounted as far as possible in their natural surroundings. To this we are indebted to the efforts of the late Sir Henry Boynton, Colonel Pease, and others, while the collections of Mr. E. W. Wade, Mr. R. Fortune and the late T. Audas have contributed interesting examples.

HORNSEA MERE.

With the help of the owner of the Mere, and a paid watcher, the interesting species of birds breeding in its vicinity are not showing any decrease. There is a Herony at the Mere, and the herons can often be seen perched on stumps round the water keeping a look-out for the fish upon which they live. The Mere is generally known to ornithologists, however, as the breeding ground of the Great Crested Grebe, a curious bird which only has a few breeding grounds in the British Islands. Other species of Grebes, various forms of ducks, etc., occur, and the woods surrounding the Mere shelter an enormous number of our most interesting songsters. While water bird life is common, the birds of prey, the Owls, Hawks, Buzzards, etc., also occur.

Among the other interesting visitors to Hornsea Mere may be mentioned the Cormorant, a species which for many years nested on the wreck of the Beaconsfield, a ship which was stranded off the shore at Aldbro' ; the Purple Heron, Bittern, Glossy Ibis, Golden Eye, Spotted Crake, Stone Curlew and others.

Hornsea Mere is the last of many Meres and Marshes which once existed in East Yorkshire, and doubtless at one time gave it the appearance of the Norfolk Broads, which are so well-known for the quantity of birds living there to-day. One of the most beautiful and interesting of the birds in Norfolk

is the Bearded Titmouse, a species which builds its nest among the reeds, the male bird having curious dark patches on the sides of its face, somewhat resembling the old 'Dundreary' whiskers of years ago, hence the name 'bearded' Titmouse.

A few years ago some pairs of this species were brought to Hornsea Mere and let loose among the reeds in the hope that they would establish themselves, and give an added charm to the fauna of the district. From reports which were received it seemed clear that for a year or two they did actually survive and nest round the mere, but their numbers grew fewer and fewer, and eventually the species disappeared altogether.

The third Sanctuary to which I refer is that of the famous

FLAMBOROUGH HEADLAND.

Standing on the high cliffs at Bempton one can see, to the north, Filey snugly sheltered in Filey Bay, with the treacherous Brig to the right; and on a fine day, Scarborough, with its castle-crowned hill, appears upon the sky-line beyond the Filey cliffs. Immediately to the south are Flamborough lighthouse and the cave-worn cliffs; beyond, Bridlington Bay and Bridlington; and in the dim distance can be seen the low cliffs of the interesting district of Holderness. In front is the North Sea, the brilliant blue waters of which are washing the cliff foot, over 400 feet below, in some parts the sea never recedes from it. Quite apart from their charming surroundings, the cliffs themselves cannot but strike the visitor with awe and wonder. At Bempton and Speeton they rise in a perpendicular wall—indeed, in some parts are overhanging—to a height of nearly 450 feet. They consist of pure chalk, the brilliant whiteness of which is softened by time, and the whole effect is enhanced by the appearance, here and there, of streaks of green, where vegetation has found a footing.

But apart from the sea, the scenery and the surroundings, the birds of Bempton cliffs are world-famous. The ledges and crannies on that great wall of rock are crowded with myriads of sea-fowl. These can easily be seen, particularly with the aid of a field-glass, their dark colour contrasting well with the background formed by the chalk. An enormous multitude, row upon row, tier upon tier, can be identified. In addition to those on the ledges, which are occupied in domestic affairs, the air is alive with a croaking, screeching throng to be numbered in tens of thousands; and the surface of the water deep down below is dotted by floating birds. At times, the sound made by this whirl of feathered life is almost deafening, and can, perhaps, best be likened to the applauding of thousands of human beings, such as one may hear (and at the farther the distance the better!) at football matches in the vicinity of our towns on a Saturday afternoon.

Here at Flamborough we have one of the principal breeding grounds of sea-fowl on the British Islands ; and every visitor to the cliffs, be he naturalist or not, must be impressed by the extraordinary profusion of bird life which occurs. The chief occupant of the cliffs is the Guillemot, a quaint-looking bird in brown and white, harlequin fashion ; the Razor-bill and Puffin also occur in numbers, while more rarely the Kittiwake, Herring-gull and Cormorant can be identified in the multitude. In recent years the Fulmar Petrel has joined the throng ; Kestrels, Carrion-crows and Jackdaws are there also, and, as might be expected, thrive well. Among smaller birds, the Stock-dove, Rock-dove, Pipit and House-martin share with their larger confrères the hospitality which these cliffs afford.

The Guillemot is unquestionably the main item in the bird calendar on Flamborough Headland. It arrives on the cliffs in May, and soon after begins to take its place on the ledges and lay its egg and bring forth its young, finally quitting the neighbourhood about the end of August. Only one egg is laid by each bird, and it is remarkable for being almost the largest egg, in comparison with the size of the bird, that is known ; weighing on an average a quarter of a pound, or one eighth of the weight of the bird. This egg is markedly pear-shaped, and, according to some authorities, it is thus, by its inability to roll, protected from the danger it must have of falling off the cliffs ; being placed, as so many of them are, on exceedingly narrow ledges, many of which slope seaward. But the shape of the egg is of little moment compared with its colouring and decoration. In no other area is such a variety of marking to be met with as in the Guillemots' eggs on Flamborough Headland. They can be obtained in almost every possible shade of green, blue, red, purple, or brown, and they are marked by blotches, streaks, pencillings, or in other ways, to a degree which can only be appreciated by an examination of the specimens themselves. No two eggs are exactly alike, consequently, here of all places can the question of variation be investigated. There are definite types of eggs, most of which can be secured at a very small cost. Collectors, however, in order to add uncommon forms to their series, contest for any unusual colouring or marking, and an exceptionally 'good' egg consequently realizes a high price.

One collector has made a special point of securing eggs of unusual shapes and sizes, irrespective of their ornament, and in this way has obtained a complete series, varying in size from a double-yolked Guillemot egg weighing 6 oz., to a small example the size of the egg of a blackbird. In shape, he has specimens assuming extraordinary outlines, resembling sausages, bottles, and other unusual forms.

To obtain the eggs, it is necessary to climb the cliffs by

means of ropes. This is accomplished by gangs of 'climmers,' to watch the operations of whom is a sight not soon forgotten. There are four or five gangs, consisting of four men each, and each gang restricts its operations to a definite part of the cliffs. The outfit of the climber consists of two stout hemp ropes, two hempen loops or 'breeches,' an iron spike surmounted by a pulley, two linen bags which are hung from the sides of the climber and crossed over to the opposite shoulder ; and last but not least, a good hat, which is stuffed with hay or other padding. This latter item, which formerly usually took the form of a 'billy-cock,' a superannuated top-hat, or a soldier's helmet, but since the war has given place to a 'tin hat,' is a very important item in the 'rig' of the climber, who knows no fear beyond that of falling pieces of chalk, which sometimes are dislodged and fall upon him. 'Broken Head,' a name given to one part of the cliffs, indicates the spot where the padding was not sufficiently effective. Accidents, however, are of exceedingly rare occurrence ; in fact, by no means so common as they are in what might be looked upon as much safer occupations.

The method of climbing is as follows : the climber places his legs through the two loops fastened to the end of a lowering rope, which is inserted in an iron pulley stuck in the ground near the cliff edge. His mates sit on the grass above, with their heels firmly implanted in the soil, and with the rope wrapped round them, a broad leather belt preventing the sliding rope from doing harm. The climber backs towards the cliff edge, slides over, and is lowered. A second or guide rope hangs down, by means of which he can signal and inform those above whether he wishes to be pulled up, or lowered. His hands are filled with grass, as a protection from the chafing of the rope, and as he descends or ascends he collects the eggs from the ledges and places them in the bags at his sides, a hooked stick enabling him to reach any awkward positions. The dexterous manner in which the climber can seize the eggs and skip along the ledges is obviously the result of years of practice, and viewed from the cliff top, the sight of a mere speck of humanity, swaying to and fro as he throws himself from ledge to ledge, is one to be remembered. In one part, where the cliffs considerably overhang, a steel rope has been secured to the face, by means of which the operator is able to draw himself under until loaded, when he leaves hold and swings back to the perpendicular. When his linen bags are fairly full of eggs, a signal is given, one hears the command, 'Up !' and hand over hand the rope is hauled in, until the head of the climber appears over the edge of the cliff. He is then able to take the weight off the rope and assist himself up the slope. The eggs are placed in a basket, unusually 'pretty'

or rarely marked eggs being put on one side, the remainder being sold at twopence or threepence each.

The season commences in the third week in May, and finishes at the end of June, or, at the latest, the first week in July, during which period, according to Mr. E. W. Wade's calculations, each gang collects from 300 to 400 eggs daily, or, allowing for wet weather, an average of 130,000 eggs per season. These are sold to collectors, and are also made use of in other ways. Notwithstanding this enormous draw upon the eggs, there appears to be no diminution in the numbers of the birds ; in fact, according to some authorities, they increase annually.

The Peregrine Falcon within recent years made its appearance on these cliffs, selecting its nesting place near Danes' Dyke in 1907 and 1908, and subsequently near Raincliffe (Buckton), where the cliff rises to 436 feet, the highest point of the Flamborough range. It was hoped that this magnificent bird would continue to nest here. It was strictly protected by the Yorkshire Naturalists' Union, with the help of subscriptions from various people interested in the preservation of our rare birds. It only remained for a few years, however.

As a contrast between the conditions which prevailed at Flamborough about a hundred and fifty years ago and those which now obtain, I give below a brief account of a visit to Flamborough on July 3rd, 1769. It is extracted from Pennant's 'A Tour in Scotland,' which was printed in Chester, in 1771. Pennant visited Scotland *via* the east coast, and called at Flamborough on his way.

'Went to Flamborough Head. The town is on the north side, consists of about one hundred and fifty small houses, entirely inhabited by fishermen, few of whom, as is said, die in their beds, but meet their fate in the element they are conversant in. Put myself under the direction of William Camidge, Cicerone of the place, who conducted me to a little creek at that time covered with fish, a fleet of cobbles having just put in. Went in one of those little boats to view the Head, coasting it for upwards of two miles. The cliffs are of a tremendous height, and amazing grandeur ; beneath are several vast caverns, some closed at the end, others are pervious, formed with a natural arch, giving a romantic passage to the boat, different from that we entered. In some places the rocks are insulated, are of a pyramidal figure, and soar up to a vast height ; the bases of most are solid, but in some pierced thro' and arched ; the colour of all these rocks is white, from the dung of the innumerable flocks of migratory birds, which quite cover the face of them, filling every little projection, every little hole that will give them leave to rest ; multitudes were swimming about, others swarmed in the air, and almost

stunned us with the variety of their croaks and screams ; I observed amongst them Cormorants, shags in small flocks, Guillemots, a few black Guillemots very shy and wild, Auks, Puffins, Kittiwakes, and Herring Gulls. Landed at the same place, but before our return to Flamborough, visited Robin Leith's hole, a vast cavern, to which there is a narrow passage from the land side ; it suddenly rises to a great height, the roof is finely arched, and the bottom is for a considerable way formed in broad steps, resembling a great but easy staircase ; the mouth opens to the sea, and gives light to the whole.'

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Birds and the Solar Eclipse.—Many tales about the extraordinary behaviour of some mammals and birds during the recent and other eclipses have been reported. I was in a favoured position, viz., in the grounds of the Giggleswick School, and within fifty yards from the Astronomer Royal and his party. Although I was keeping my eyes on 'Old Sol' (through coloured glasses), my ears were entirely devoted to the songs and notes of the birds around. The time of totality was just after 6-24 a.m. (s.t.) on June 29th, 1927. About fifteen minutes before totality, when it was becoming somewhat dark, there was a distinct falling off in bird song, which culminated with two Willow Warblers, which only ceased singing just five minutes before totality. Then there was entire silence in bird song for twenty minutes. A quarter of an hour after totality two Willow Warblers recommenced singing ; they were almost immediately followed by a Tree Pipit, and two or three Skylarks leaped into the air, and in a few minutes later the whole chorus of bird song was in full swing again. What impressed me the most was that there was not the slightest sign of any fear or alarm in any of the birds' songs or notes. They simply suspended singing during the darkest period. Their songs were quite as full of the joy of life when they resumed as they had been before they stopped singing. Although I gave the use of my eyes entirely to the sun during the very short period of eclipse totality, yet I could not help noticing the behaviour of three Rooks and three Black-headed Gulls that happened to be overhead at the time. They sailed about in the most aimless manner possible. No doubt they would have liked to have come down to earth during the increasing darkness, but were dismayed by the crowds of people, motor parks, etc., and could not make up their minds what to do in the dilemma. They were far more upset by the results of the eclipse than the song birds were.—H. B. BOOTH, Ben Rhydding.

On Beverley Westwood, near Hull, where the eclipse was almost total, the effect on bird life was nil, and all went on as though nothing was happening.—ED.

LEAD-MINING AND SMELTING IN W. YORKSHIRE*

A. RAISTRICK, Ph.D., M.Sc., F.G.S.

THE West Yorkshire Dales, at various times, have afforded abundant evidence of the activity of lead miners and smelters in Roman times, in pigs of smelted lead, as at Dacre in Nidderdale, adit workings at the Hurst Mine, Swaledale; and numerous shallow trench workings at various parts of Greenhow Hill, Grassington Moor, and Swaledale. The Nidderdale lead pigs bear the stamp of Domitiano, corresponding to the year A.D. 81, and a pig from Swaledale the stamp of Adrian (A.D. 117-138).



Old Providence Mine, Kettlewell.

The weight of various of the pigs of lead is interesting, especially in connection with the question of continuity of mining since Roman times. The Yorkshire examples are of the following weights: 175 lb., 175 lb., 170 lb., 85 lb., and one from South Cave† 'nearly ten stones'; some Derbyshire examples are 173 lb., 126 lb. and 84 lb. Throughout the country, pigs of Roman lead approximate in weight to 175 lb. or fractions of that weight, and it is now suggested that this is the sixteenth of the miners' 'fodder' (actually the sixteenth is 176½ lb.), and the equivalent of 240 Roman pounds. The pigs of lead cast in recent time at the mines where there has been undoubtedly Roman working, still use 175 lbs. and other fractions of a

* Abstract from a paper read to the Newcomen Society for the Study of the History of Engineering and Technology, March, 1927.

† Record of Additions : Hull Museum Publications, No. 141.

fodder as the pig weight, while mines of seventeenth and later centuries use the hundredweight of 112 lb.

The earliest method of seeking lead, and one in use as late as the end of the nineteenth century, is that known as 'hushing,' described by Pliny in his *Natural History*. In brief, a hillside is chosen, of likely appearance, and at the crest an earthen dam is built, to impound drainage water. When the pond is full, the bank is broken and an artificial 'cloud burst' scours the loose material and weathered rock from the hill side, laying bare mineral veins if any are present. The loose ore that has accumulated at the surface of a vein, when present, is carried down the slope, and can be collected from the dry delta at the foot. Pliny's description would apply without the alteration of a single word, to any of the hundreds of hushes in the Dales, and from the scarcity of them elsewhere, it is probable that he was describing the methods used in the Pennine area. There is much evidence that lead was being exported from the Pennines, probably by the Humber estuary, during the second and third centuries A.D.

The practice of driving levels was developed by the Romans in South Wales, Shropshire, and Cheshire, and it is evident that a group of old workings broken into last century in the Hurst Mine, Swaledale, in which the pig of Roman lead, and other remains were found, are of Roman date. On Greenhow Hill, two small levels are reputed to be of Roman date, and there is much to support this in their exact correspondence in size and mode of driving with those of Wales and Cheshire. They are the Jackass Level, and the Sam Oun Panty Level, both in Gill Beck; they are driven through the Grit to the Limestone about 300 yds., and are of uniform section, 3 ft. by 2 ft., until meeting the vein.

Though there are no Saxon references to the Yorkshire Mines, the Saxon (or Anglian) settlers of Swaledale in the seventh century gave the name Auld Gang and Auld Graeves (Groves) to two of the mines near Reeth and Gunnerside, and some others of the mines bear Saxon names in other parts of the Dales. In the thirteenth century a large group of mines had been granted to various monastic houses of Yorkshire, and many of the disputes which arose as to their true ownership, reveal grants in the eleventh and twelfth centuries. An account of the export of lead from Yarm-on-Tees, in 1182, shows the mining industry to be in a flourishing state, and shows Yorkshire as a very important contributor to the lead being used in the south for the roofing of cathedrals, monasteries, and castles. The lead was carried from the Dales by way of Askrigg and Arkengarthdale to Yarm. In Edward the First's time, the question of weights and measures was agitated, the various merchants using their own weights, and refusing to

unify them. The lead was sold by the 'wey' or 'carretate.' The common wey was 15 stones, but Richmond and Yarm insisted on supplying a wey of only 14 stones, while their carretate (or cartload) varied in the same manner. The value can be gleaned from the Jervaulx Abbey accounts, where the following payment was made :

1294.	8 waghes of lead and proceeds of a coal mine	16	4
	6 carretates and 81 waghes of lead	£7	0 5 <i>1</i>



Typical Arch Masonry—in 'bad' ground.

Grants of mines in Swaledale, Wensleydale, and at Greenhow are common at various dates between 1219 and 1500, and the number of mines being opened speaks of the importance of the trade.

Throughout the early period the ore was smelted in close proximity to the mine, by means of Bayle Hills. Sections of several of these have enabled a reconstruction to be made; they consist of a rough stone wall, from 5 to 20 feet diameter and a few feet high, built on ground sloping and open to the south-west (the direction of the reliable wind). On the south-west

side there are air openings left at the foot of the wall, to ensure a draught, and at the opposite side, a small trench leading from the central hollow within the wall passes under the wall to a hole outside. A layer of brushwood and peat was built up inside, the ore to be smelted placed on top, and when the south west wind was blowing the fire was lighted. With the steady draught, and a renewed supply of peat and wood, heat sufficient to smelt the soft ore was obtained, and the melted lead ran out of the Bayle to the outside hole or mould. The Bayle hills are very common in Yorkshire around the older mines, and accounts for 'boling ore' can be found in many of the monastic books of Yorkshire and Durham.

During the fifteenth and sixteenth centuries, the Bayle was displaced by the Ore Hearth, brought by miners from Germany to Keswick in 1565, for the smelting of copper, but adopted soon after in Yorkshire for the smelting of lead. This has remained the principal type of furnace, to the present day, for use with the Yorkshire ores, and a modification of it, the 'Scotch' ore hearth, has recently been successfully introduced in America. It is probable that Yorkshire's great contribution to smelting practice was the early adoption of coal as fuel. The Germans at Keswick used coal in 1569, for the first time, but the Swaledale mines sought the grant of a coal mine (Takk Tan, or Tan Hill) in 1433, and from that date onward for a long period, the returns of the coal mine are included in the smelting accounts of the mines. The Richmond Market tolls include coal, lead, faggots, and wood, as well as charcoal. Coal, however, never became the dominant fuel, but in the ore hearth was always used with peat, as is the present practice. Up to the sixteenth century, the mine leases include mines in Swaledale, Wensleydale, Nidderdale, Greenhow, Kettlewell, Elbolton, Cononley, and Malham, with trials for lead at Appletreewick, Bolton, and Farnhill.

The principal expansion of the mines took place in the sixteenth century, when the great 'setts' of the principal mines were obtained. In Arkengarthdale, the Bathurst family took leases of most of the mining ground and built up the great 'C.B.' (Charles Bathurst) group of mines. The mines were nearly all shallow shafts sunk on the back of the vein, worked until watered out. The veins and strings were sufficiently numerous to allow this form of working, the shafts being sunk side by side the full length of one vein, then along the next nearest and so on. One of the mines opened at that time, later opened out with levels and became one of the largest mines in Yorkshire, having over thirty miles of levels and cross cuts in connection, in the Old Gang, Surrender, and C.B. setts. The winding and pumping of the mines was dependent on the 'horse-gin,' the pumps being chains of buckets, lifting

water from the sump at the shaft foot. The chief difficulty of the miners of this period was the large quantity of water encountered, and the bad air of their short levels. In 1556 Agricola in his *De Re Metallica*, included an exhaustive section on pumps, but there is no evidence in the Dales that his methods of pumping with water wheels was adopted, although several wheels were built at mines in Cumberland and Durham. The supply of good air in the levels was dependant on a shaft being sunk at the fore-head of the working, and as the hillsides in Yorkshire are very steep, a very short level soon needs a very



Adit in sound rock, Merryfield Sett, Nidderdale.

deep shaft for ventilation, and prior to the application of gunpowder to mine work, the shafts soon became too deep for the miners' skill. It was therefore fairly late before the long adit was introduced in this district. The rock was worked by means of the ' plug and feather,' the plug being a blunt wedge of iron driven between two sharper wedges of iron, the feathers, which were placed in a drilled hole in the rock. A row of holes worked simultaneously were very effective, and the method is still frequently used by engineers in positions where explosives cannot safely be employed. Plugs and feathers are very commonly found in the older mine workings. Another method much used for rock blasting was to drill a hole, fill it with rammed quick lime, plug the hole with a wood plug having a

small hole through it, then force water into the lime. The expansion on slaking provides sufficient force to split the rock when several holes are used. Some veins show that 'firing' was commonly used where quartz or hard sandstone forms the cheek of the vein. A fire is built against the vein, and when the rocks reach a suitable temperature, the rock is 'doused' with water, and splintered so as to be workable with a pick.

The eighteenth century saw a revival and expansion of mining, dependant on the application of gunpowder to blasting, and the invention of the steam engine for pumping. The steam engine never became popular in the Dales, partly because of the abundant water power, and partly because the deep valleys allow facilities for drainage of the mines by deep levels. Water-wheels from 30 to 65 feet diameter are very common at most of the mines, and in some of the larger mines, banks of wheels, some underground, were used. Deep pumping and possibility of long levels made the eighteenth century a period of unrivalled mine speculation. Lead prices were good, and Britain held many foreign and colonial markets. Old veins were sunk upon by deep shafts, and new veins sought by long cross cuts made from a low point in the nearest stream course, which when completed would serve both as way gate to the mines and as a deep drain. The first of the large drainage levels in the north was the one in Alston Moor, Smeaton's Level, designed by Smeaton and started in 1776, at Alston; it was driven $4\frac{1}{2}$ miles, and is 9 feet square. It took 69 years to complete, but drained the greater part of the Nent Head field in such manner that even to-day there is scarcely a pump to be found in that area. In Swaledale deep levels were projected for most of the setts, and the enormous capital burden of these was partly responsible for the failure of the industry towards the end of the nineteenth century. Such levels are the Sir George at Keld, Sir Francis, Gunnerside; Boat Level, Punchard Gill; and others. At Grassington, the Yarnbury Mines were drained by the Duke's Level, cut at a cost of £33,000, but the Grassington Moor Mines depended on water power pumps. Many of these levels took from 10 to 60 years to drive, and during the time of their building, the import of cheap Spanish lead about 1860, and onwards, made their capital burden too great for the Yorkshire mines to bear. A further cause contributing to the failure of Yorkshire mines is the rather low silver content of the lead compared with the lead of the Spanish mines.

In Wensleydale and Grassington Moor, the topography does not make deep adit drainage a feasible scheme, and it seems as though the companies there, adopting the cheaper water pumping, devoted their capital to the improvement of smelting methods. The Keld Heads Smelt Mill, Wensleydale, rapidly became one of the finest in the north, and from it, new

designs of ore hearth and condensers, and new processes, were disseminated during the nineteenth century. In the middle of the eighteenth century Keld Heads adopted the cupola or reverberatory furnace, but never to the exclusion of the ore hearth.

In 1778 Bishop Watson in his *Essay on Derbyshire Ores* had pointed out that in smelting, a great quantity of lead was lost as lead fume, and suggested the condensation of this fume. It was long before his suggestion was adopted in Derbyshire, and it was in Yorkshire that the chief development took place. Long flues were built on the surface of the ground, leading from the furnace to a chimney on high ground, the flues often being over a mile in length. There is strong sugges-



Merryfield Hole Mine, Ashfield Gill, Greenhow Hill.

tion that the flues in Yorkshire were already in existence before Watson's essay, and in any case they are among the earliest in the country. At Keld Heads, however, other methods of condensation of fume were invented, notable among which is Stokoes Condenser (described in Percy's '*Metallurgy of Lead*', 1870, p. 442). The value of the lead recovered (7 per cent. in a good flue) made the flues a very good investment. Much of the later smelting practice in this country has been improved or originated in our Yorkshire Mills, and it is certain that Yorkshire miners have contributed very largely to the technique of mining now prevalent.

In the middle of the nineteenth century the Limited Liability Company Act initiated a new era of mine exploitation, backed by newer and larger capital, and the development of the Yorkshire lead fields settled down to its most recent phase, that of deeper exploitation, re-organisation of old mines, and

improvements in mine planning. Counterbalancing the improvements and the advantages of new capital organisation, two factors tend towards the decline of the industry, the increasing import of cheap ore from abroad, and the 'nipping' of the veins in depth. In Nidderdale, the enhanced value of the gangues, barytes and fluor spar, previously neglected, has enabled some of the mines to re-open on a small scale, and a vigorous company is now at work opening to new veins, and developing some not previously worked out. A full appreciation of the last hundred years of mining history in Yorkshire, can, however, only be obtained by study of details of mine organisation and smelting methods too technical for this paper, while the future of the industry depends on the balancing of a large complex of economic and technical factors.

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Tufted Duck in the West Riding.—On a sheet of private water in the West Riding, three years ago, two pairs of Tufted Duck were observed. Since then the colony has steadily increased and at the present time there are at least ten pairs. For obvious reasons the exact locality is not divulged.—B. MORLEY.

Parasites on Swallow.—Mr. Edward Cocker, of Huddersfield, informs me that on June 30th a swallow was evidently dying on the canal bank at Huddersfield. It was quite incapable of proper flight, being only able to flutter along the ground. The Swallow was the host of numerous parasites, circular and crab-like in shape, about a quarter of an inch in diameter, green coloured above with the legs of a pinkish hue, and very active creatures. The bird was secured by the primaries and dipped into the water, and when taken out again more than a dozen of the parasites were seen upon its back, but they quickly burrowed under the feathers again.—B. MORLEY.

Goshawk near Pontefract.—On June 6th, in Stapleton Park, near Pontefract, Mr. Bailiff, head keeper to Major Haliday, had a remarkably fine live Goshawk which he had just stunned by gunshot. On the previous day the male of a pair of partridges was missed, and the keeper was watching the hen partridge and her chicks when the hawk appeared, and was in the act of striking when the shot was fired. Where the shot had struck the bird could not be ascertained, as no blood-stains could be seen. It quickly recovered and became very fierce, but it was dispatched. The bird had been in the neighbourhood for some time. The keeper said that since April he had frequently seen the remains of lambs, partridges and wood-pigeons, which could not have been the victims of foxes, as the bones were not eaten.—B. MORLEY..

MUSEUM DIRECTORS IN THE ISLE OF MAN.

THE Annual Conference of the Museums Association was held at Douglas, in the Isle of Man, from July 2nd to 8th. The mornings were occupied by papers, discussions, and meetings of committees, and the afternoons by motor visits to various parts of the Island to examine the Museums and castles, private collections of china, etc.; and the Marine Biological Station at Port Erin. Unfortunately it rained incessantly.

Mr. J. Charlton Deas was the retiring President, and his Presidential address occupied some attention in the press. For the first time he wore a chain and jewel, or badge of office, presented to the Association by Mr. James Downs, J.P., who was President of the Local Committee when the Association met at Hull. Each link contains the name of a past-President.

The principal topic of discussion arose from two lengthy reports given by Mr. Grundy (Editor of *The Connoisseur*), and Dr. E. E. Lowe, of the Leicester Museum and Art Gallery, of visits they had made to America. The former represented the Museums' Association and the latter the Carnegie Trust. These gentlemen gave interesting accounts of the American Museums and their methods, which were apparently very different from those of this country. In the first place, the idea of a central storehouse of information on the lines of the British Museum is an impossibility in the United States, on account of the distance between one Museum and another. For example, in order to reach some of the American museums, distances had to be covered greater than that between London and Jerusalem. This made central bureaus in America almost impossible, and created the necessity for several general museums, on a large scale, in different areas. Apparently the chief duty of a Director of an American Museum or Art Gallery is to solicit funds, and a persuading manner and a good 'telephone voice' were desirable for this purpose! In addition, the average American citizen seems to look upon it as his duty to assist the Museum movement, and the incomes of some of the larger museums, extending to hundreds of thousands of pounds, were due entirely to what might be termed 'voluntary subscriptions' on the part of wealthy subscribers, who become Trustees, and have certain privileges. Occasionally, but rarely, is a Museum state-aided, and assistance when given is from the Educational authorities. One instance was given where the special 'solicitors' employed (this word being used in its strict sense and not as that of a lawyer), were successful in obtaining £3,000,000 for the town museum before the building was started. In this way extraordinarily imposing buildings are erected to receive such collections as seem desirable, and these are usually furnished on a lavish scale, each town endeavouring to improve upon its neighbour. As Dr. Lowe pointed out 'One Museum had five baths for the

convenience of the staff ; there are no towels, you put your face in front of a spout, press a button and a blast of hot air blows you dry.' It seems in America the staff has an opportunity of playing tennis and attending dances, etc., after their duties at the Museum are over.

On this subject the Press Association interviewed a past-President of the Association, Mr. T. Sheppard. The report states : ' He controls five museums, claimed to be the largest number in any town in the country. There is no doubt that British museums can still hold their own from the point of view of education, arrangement, and classification,' he said. ' Whatever wealth may do in America, the solid methods of British archæologists and naturalists provide a more substantial basis for their museum collections. Another generation will see the great advantage of visits of scholars to museums. There is a greatly increasing interest in museums, purely because the public is realising what they can do. Unquestionably year by year museums play a more important part in educational work, and the visits of school children, now systematically arranged at most museums are proving invaluable.' In Hull, children of the scholars Mr. Sheppard taught years ago are now interested visitors.

Besides papers dealing with the local museums and local methods, antiquities, etc., Sir Henry Miers, F.R.S., gave an instructive account of a simple method of exhibiting minerals for the use of smaller Museums ; Professor L. R. Renouf suggested the formation of a Committee to arrange for the exchange of duplicates between Museums and Galleries ; Sir Francis Ogilvie referred to the desirability of a museum illustrating the particular antiquities and physical features of the locality in which it is situated, and suggested that, where it was possible to do so, the local industries should be represented. Other subjects discussed were the Training of Museum Curators ; Exhibiting Wild Flowers ; Museum Labels, etc.

The invitation from the Isle of Man came from the Trustees of the Manx Museum, and certainly the new museum which these people have erected is creditable to the Island. An interesting souvenir containing picture postcards of the principal exhibits, aptly demonstrated the attractions of the Island, and whether from the point of view of an archaeologist or from that of a naturalist, the exhibits were representative of the Island. The visitors were particularly indebted to Mr. P. M. C. Kermode and to Mr. Cobham for their assistance, in addition to which we were glad to welcome the veteran naturalist, Mr. P. G. Ralph, whose work on the islandia avifauna is well-known. The Museum reflects credit upon the different people who have been interested in the archaeology, geology and natural history of the Island.

NATURAL HISTORY OF GRASS WOOD AND ITS ENVIRONS.

F. A. MASON, F.R.M.S.

(Continued from page 214).

ECONOMIC BIOLOGY.—The forestry aspect of Grass Wood has been touched upon by Mr. Malin Smith in his notes on the ecology of the Wood,

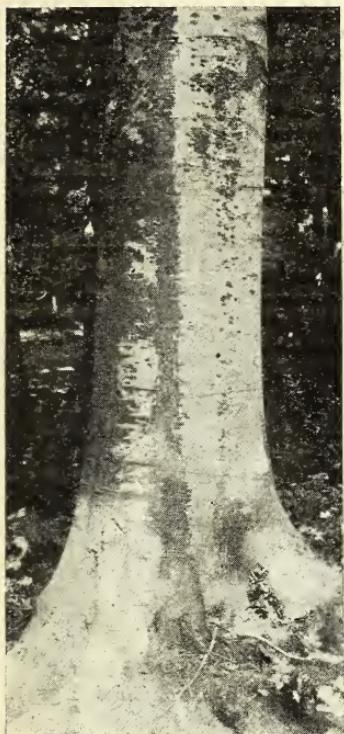


Photo by]

FIG. 1.

Sister Beeches, Grass Wood.



[F.A.M.]

FIG. 2.

and he has referred to the grave menace of the rabbit to the plantations. Some other pests have made their appearance in the Wood, and the most recent of these is the Felted Beech Coccus, *Cryptococcus fagi*. It is only during the last four or five years that this destructive insect has been observed in the Wood, and at the present time several large trees are attacked, one of them very severely. The foliage of the last mentioned tree is already showing signs of thinning, and this is one of the indications that destruction has begun.

The Larch is much more seriously attacked by the Larch Canker fungus, *Tricoscypha calycina* (*Dasyphypha calycina*), and there are many examples of the completely destructive effects of this fungus. The disease is rather unequally distributed; the worst area lies to the north-west of High Gregory. An area planted in 1899 is also showing signs of severe attack.

The Ash throughout the district is severely cankered, and the planting of this tree has been discontinued; Larch, Pine, Spruce and Beech are the only trees which have been planted for some years. It is worth recording that Birch, in addition to Ash and Sycamore, has been planted within the last forty years, but it has been destroyed by *Polyporus betulinus*.

A group of Beeches situated due west of High Gregory possesses special interest on account of a curious malformation of the bole exhibited by one of them. This is a well known tree, and the Forester (Mr. E. J. Cutmore) informs me that there is a considerable demand for the bole when felled, by museum and other authorities. It represents a good example of a condition known to plant pathologists as *hyperplasia*. It is impossible to give any explanation of the malformation until the cell structure can be examined. It is all the more interesting because it grows alongside normal Beeches planted at the same time, about seventy years ago, and a comparison of the abnormal and normal sister trees enables one to judge of the effect of the former's physiological derangement. Figures 1 and 2 illustrate these differences; the two trees stand only a few yards apart. Each has been photographed at equal distance from the vertical axis of the trunk (10 feet to front of lens), and the difference in the diameters shown in the photographs is strictly proportional. Circumference of trunk at 5 ft. :—

Normal tree, 5 feet 7 inches; abnormal tree, 3 feet 6 inches.

The malformation has a circumference at greatest girth of 11 feet, whilst its height from the commencement of the growth from the bottom to the highest point at which it returns to the trunk is 3 feet 6 inches. The sides presented in these photographs face due west.

The height of the malformed tree is 45 feet, while that of the normal specimen is 50 feet. The woodman has been good enough to compute the volume of the useful timber in the two trees, with rather surprising results; the timber in the one is $8\frac{1}{2}$ cubic feet, whereas that in the normal tree is 40 cubic feet.

DIPTERA (Chris. A. Cheetham).—The Diptera in this list must be recognised as those likely to be found on a windy day somewhat on the cool side. The sun-loving flies are not in evidence, and the collecting was done mostly in sheltered corners, such as the bottom of Dib Scar. The most interesting are the species of *Phronia*, these have a larva living on dead trunks of trees, which turn into a limpet-like pupa in these places.

<i>Sciara hispida</i> Winn.	<i>Dicranomyia modesta</i> Mg.
<i>Trichonta melanura</i> Staeg. (<i>melanopyga</i> Ztt.).	<i>Empeda nubila</i> Schum.
<i>Brachypeza helvetica</i> Wlk. (<i>spuria</i> Verr.).	<i>Gonomyia dentata</i> Meij.
<i>Mycetophila marginata</i> Winn.	<i>Dactylolabis sexmaculata</i> Mcq. (<i>frauenfeldti</i> Egg.).
<i>M. formosa</i> Lundst.	<i>D. gracilipes</i> Lw.
<i>Phronia praecox</i> (Winn.) Edw.	<i>Ormosia nodulosa</i> (Mcq.) Meij.
<i>P. signata</i> Winn.	<i>Amalopsis immaculata</i> Mg.
<i>P. forcipata</i> Winn.	<i>Trichocera regulationis</i> L.
<i>P. (possibly) tenuis.</i>	<i>Pachyrrhina maculata</i> Mg.
<i>Boletina griphoides</i> Edw.	<i>Tipula alpium</i> Brgr.
<i>B. inermis</i> Lundst.	<i>T. hortulana</i> Mg.
<i>B. plana</i> Wlk.	<i>T. variipennis</i> Mg.
<i>B. trivittata</i> Mg.	<i>T. flavolineata</i> Mg.
<i>Macrocerata fasciata</i> Mg.	<i>T. vernalis</i> Mg.
<i>M. centralis</i> Mg.	<i>Rhyphus punctatus</i> F.
<i>Boletophila hybrida</i> Mg.	<i>Empis tessellata</i> F.
<i>Neuratelia nemoralis</i> Mg.	<i>E. livida</i> L.
<i>Mycomyia ornata</i> Mg.	<i>E. trigramma</i> Mg.
<i>Dilophus femoratus</i> Mg.	<i>E. bilineata</i> Lw.
<i>Bibio johannis</i> L.	<i>E. pennaria</i> Fln. (<i>vernalis</i> Mg.).
<i>Limnobia flavipes</i> F.	<i>Rhamphomyia flava</i> Fln.
	<i>R. platyptera</i> Panz.

<i>Hilara pubipes</i> Lw.	<i>Lasiops semicinereus</i> Wied.
<i>H. maura</i> F.	<i>Hydrotaea albipuncta</i> Ztt.
<i>Microphorus velutinus</i> Mcq.	<i>Hylemyia variata</i> Fal.
<i>Ocydromia glabricula</i> Mg.	<i>H. strigosa</i> F.
<i>Hemerodromia prectoria</i> Fln.	<i>H. nigrimana</i> Mg.
<i>Tachydromia longicornis</i> Mg.	<i>H. cinerosa</i> Ztt.
<i>T. verralli</i> Coll.	<i>Hydrophoria conica</i> W.
<i>T. agilis</i> Mg.	<i>Fannia ærea</i> Ztt.
<i>Porphyrops crassipes</i> Mg.	<i>F. sociella</i> Ztt.
<i>Argyra diaphana</i> F.	<i>F. mutica</i> Ztt.
<i>Pipunculus campestris</i> Ltr.	<i>Azelia cilipes</i> Hal.
	<i>A. triquetra</i> Wied.
<i>Chalarus spurius</i> Fln.	<i>A. macquarti</i> Staeg.
<i>Pipizella heringi</i> Ztt.	<i>A. zetterstedti</i> Rnd.
<i>Chilosia sparsa</i> Lw. (Verrall).	<i>Trichopticus hirsutulus</i> Ztt.
<i>C. antiqua</i> Mg. (Verrall).	<i>Scatophaga squalida</i> Mg.
<i>Melanostoma scalare</i> F.	<i>Neoleria inscripta</i> Mg.
<i>Platychirus albimanus</i> F.	<i>Dryomyza decrepita</i> Ztt.
<i>P. immarginatus</i> Ztt.	<i>Ectinocera borealis</i> Ztt.
<i>Syrphus ribesii</i> L.	<i>Psila nigra</i> Fln.
<i>Myiospila meditabunda</i> F.	<i>P. nigricornis</i> Mg.
<i>Poliotes lardaria</i> F.	<i>Scaptomyza tetrica</i> Bkr.
<i>Phaonia incana</i> W.	<i>Drosophila transversa</i> Fln.
<i>Hera variabilis</i> Fln.	

FRESHWATER BIOLOGY (E. Percival, B.Sc.).—The stream flowing from Dibb Scar was examined in its upper part. The water issues from the limestone in a number of small springs which form a small trickle among loose stones of varying size. The current is probably never fast, and at the time of examination was about 1 ft. per second. There is very little sediment, and what there is occurs as the floor of small open stretches of water up to 1 yard in diameter. The depth varies up to about 6 inches. In places, near and around the springs, there are masses of Marchantia. (The temperature was low, but no accurate record was made.).

The fauna presented several interesting features, and a number of insect larvæ were found. The most abundant were the nymphs of some *Ephemeroptera*. *Centroptilum luteolum* was in thousands running about on the bottom of the quiet water or running about in short darts. This is the first time that this nymph has been seen in such numbers in Yorkshire. It is probably very common in such places. Along with it were nymphs of *Bætis pumilus* and *B. binoculatus*. Under the stones were large numbers of the nymphs of *Erdzurus lateralis*. This species was much more abundant than the otherwise common *Erdzurus venosus*. It appears to favour situations where the water is quietly flowing and where there is not much depth. The other species was *Leptophlebia submarginata*, numerous submargins of which were found under stones, and a few nymphs along with *E. lateralis*.

The Plecoptera were not represented by many species. The adult *Nemura cambrica* was common, and the nymph was taken from under stones. There were many cast skins. *Lenetra nigra*, *Isopteryx torrentium* and *Perla cephalotes* were present.

The Trichoptera taken were the larvæ of *Stenophylax stellatus*, which were numerous in places, and, without exception, in the part examined, made their cases entirely from pieces of the fronds of Marchantia. This is unusual, as the species normally uses a considerable amount of coarse sand and fills up with fragments of dead vegetable matter. There was plenty of stone about, and why only the liverwort was used is puzzling. *Agapetus procipes* was abundant, as it usually is in stony places, larvæ, pupæ and adults being taken. *Plectrocnemia conspersa* was obtained as larvæ. Also a species of *Tinodes*, undescribed in the larval

stage, and an unknown Trichopterous larva. The very common larva of *Elmis aeneus* was present. The Dipterous larvæ were *Oxycera* sp., an interesting Stratiomyid living abundantly in the thin layer of water covering the fronds of *Marchantia*; *Dixa* sp. in similar conditions; and *Pedicia rivosa*, the larva being found once, under a stone. The practically ubiquitous *Gammarus pulex* was common everywhere.

The Turbellarian, *Planaria alpina*, was also common, both inactive under stones, swimming about in full light on the bottom and under the surface film.

A single *Gordius aquaticus* was taken.

An unusual inhabitant of this stream was a larva of *Sialis lutaria*. This species normally inhabits slow streams with muddy floors carrying a considerable amount of organic detritus.

It will be seen that some of the genera are those which have been included in the 'Fauna Hygropetrica,' by Thienemann, e.g., *Oxycera*, *Dixa*. These are said to frequent the surfaces of stones covered with a thin sheet of water. They certainly are not happy in a depth of more than a few millimetres, and are very fond of creeping about on surfaces which are merely wet, and not submerged. *Planaria alpina* is regarded as a Glacial relict, especially since it prefers cold waters of uniform temperature. In Yorkshire it is most abundant in springs having a temperature of 8 to 9.5 degrees Centigrade throughout the year.

The fauna as a whole is typical of the conditions. *Sialis* was probably accidental, as it does not strictly belong to the fauna of Upper Wharfedale.

Hebden Beck was superficially dealt with above Hebden, and showed features of considerable interest. It could be divided into two portions, an upper moorland stretch with poor fauna, and a lower portion with a richer fauna, each characterised by a species of *Leuctra* (see below). The dividing region is a rough fall, where the upper portion joins the valley. The stream is on Millstone Grit, and is of the torrential type containing large waterworn blocks of stone bearing a thick growth of filamentous algae. The most abundant animals appeared to be *Leuctra inermis* and *Amphinemura cinerea*. The adults were present in quantity, and almost every projecting stone carried up to hundreds of cast skins. The fauna, as determined, was as follows:—

Up to the moorland stretch—

<i>Baetis pumilus.</i>	<i>Isopteryx torrentium.</i>
<i>Perlodes mortoni.</i>	<i>I. tripunctata</i> (common).
<i>Chloroperla grammatica.</i>	<i>Perla cephalotes.</i>
<i>Leuctra inermis</i> (abundant).	<i>Ecclopteryx guttulata.</i>
<i>Amphinemura cinerea</i> (abundant).	<i>Plectrocnemia conspersa.</i>
<i>Protonemura mezeri.</i>	<i>Velia currens</i> (abundant).

The moorland portion—

<i>Leuctra hippopus</i> (abundant).	<i>Microptema sequax.</i>
<i>Chloroperla grammatica.</i>	<i>Velia currens</i> (abundant).
<i>Baetis rhodani.</i>	<i>Gerres najas</i> (common in places).

The fauna here appears to be made up of very large numbers of a few species.

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According to the press, a Sun Fish, seven feet long and five feet wide, and weighing about thirty hundredweight, was washed up at Allonby, Cumberland, on the Solway Firth, on June 29th.

The British Museum (Natural History) has issued a series of Picture Postcards of British Game Birds. There is now on sale Set C 20, illustrating by means of five coloured cards accompanied by an explanatory leaflet, Capercaillie, Red Grouse, Irish Grouse, Black Grouse (Blackcock and Greyhen), Ptarmigan, Common Snipe and Jack Snipe. The price of the Set is 1s., or 1s. id. if sent by post.

ENTOMOLOGISTS AT BUTTERCRAMBE WOODS.

W. D. HINCKS.

ON July 18th, the Entomological Section of the Yorkshire Naturalists' Union held a field meeting at Buttercrambe Woods, near York, by kind permission of J. Gomersall, Esq., of Cleckheaton. Had the weather proved more favourable, the locality would have been a very good one for insects.

Mr. M. L. Thompson records the following :—

COLEOPTERA.

<i>Atheta incana</i> Er.	<i>Rhagonycha testacea</i> L.
<i>Actobius cinerascens</i> Grav.	<i>Malthodes flavoguttatus</i> Kies.
<i>Quedius umbrinus</i> Ev.	<i>Cryptocephalus labiatus</i> L.
<i>Cyphon padi</i> L.	

HEMIPTERA.

<i>Elasmostethus griseus</i> L.	<i>Psallus ambiguus</i> Fall.
<i>Monalocoris filicis</i> L.	<i>P. betuleti</i> Fall.

Mr. W. D. Hincks notes the following species so far identified :—

COLEOPTERA.

<i>Oxyporus rufus</i> L.	<i>Strophosomus melanogrammus</i> Forst.
<i>Byturus tormentosus</i> F.	<i>Liosoma deflexum</i> Panz.
<i>Phyllopertha horticola</i> L.	<i>Cidnorrhinus quadrimaculatus</i> L.
<i>Helodes minuta</i> L.	<i>Ceuthorrhynchus assimilis</i> Pk.
<i>Cantharis lituratus</i> Fall. (black var.)	<i>Anoplus plantaris</i> Næz.
<i>Malthodes marginatus</i> Latr.	<i>Orcheses rusci</i> Hbst.
<i>Rhagonycha lignosa</i> Müll.	<i>Rhamphus pulicarius</i> Hbst.
<i>Dryophilus pusillus</i> Gyll.	<i>Cionus scrophulariae</i> L.
<i>Cryptocephalus labiatus</i> L.	<i>Apion curtirostre</i> Germ.
<i>Phyllodecta vitellinae</i> L.	<i>Rhynchites betulae</i> L.
<i>Luperus longicornis</i> Fab.	<i>R. nanus</i> Pk.
<i>Polydrusus cervinus</i> L.	<i>R. tormentosus</i> Gyll.

HEMIPTERA.

<i>Oncopsis rufusculus</i> .	<i>Capsus ruber</i> .
<i>Anthocoris confusus</i> .	
<i>Liocoris triplustulatus</i> .	<i>Psallus betuleti</i> .

HYMENOPTERA.

<i>Tenthredo mesomela</i> L.	<i>Pachyprotasis rapae</i> L.
<i>Tenthredopsis palmata</i> Goeff.	<i>Stromboceros delicatulus</i> Fall.
<i>Rhogogaster viridis</i> L.	(common on Ferns).

DIPTERA.

<i>Macrocerata lutea</i> Mq.	<i>Gymnopternus aërosus</i> Fln.
<i>Serromyia morio</i> F.	<i>Pipeza lugubris</i> F.
<i>Culex pipiens</i> L.	<i>Syrphus venustus</i> Mq.
<i>Ptychoptera lacustris</i> Mq.	<i>S. bifasciatus</i> F.
<i>Microchrysa flavicornis</i> Mq.	<i>Platycharis peltatus</i> Mq.
<i>Beris vallata</i> Forst.	<i>Alloestylus diaphanus</i> .
<i>B. geniculata</i> Curt,	<i>Phaonia pallida</i> F.
<i>Dioctria rufipes</i> DeG.	<i>Tetanocera elata</i> F.
<i>Ocydromia glabricula</i> Mq.	<i>Sciomyza albocostata</i> Fln.
<i>Tachydromia lutea</i> Fln.	<i>Micropeza corrigiolata</i> L.
<i>Chelisphaerica precatoria</i> Fln.	<i>Lonchaea chorea</i> F.
<i>Dolichopus trivialis</i> Hal.	<i>Opomyza germinationis</i> L.
<i>Neurigona quadrifasciata</i> F.	<i>Rivellia syngenesiae</i> F.
1 ♂, new to Yorkshire.	<i>Spilographa oe</i> Mq.
<i>Argyza leucocephala</i> Mq.	

NEW YORKSHIRE MIDGEs.

W. D. HINCKS.

THE following list gives the additions in the sub-family Chironominæ of Yorkshire. My best thanks are due to Messrs. Butterfield, Percival, Cheetham & Dibb for allowing me to examine collections and specimens. I am indebted to Mr. F. W. Edwards of the British Museum, and Dr. Goetghebuer of Brussels, for kindly confirming many of my identifications.

R.B. = Rosse Butterfield ; G.G. = G. Grace ; J.R.D. = J. R. Dibb ; Records without initials are my own.

- Chironomus (Paratendipes) plebius* Mq. Ilkley, G.G.
C. (Polypedilum) scalenus Schr. Keighley, 20/5/25, R.B.
C. " blandus v. de W. Keighley, 1925, R.B.
C. (Microtendipes) zonarius Wlk. Keighley, 20/5/25, R.B. Collingham Bridge, 9/5/26.
C. (Endochironomus) albipennis Ztt. Askham Bog, 20/6/25. Keighley, 9/8/25, R.B.
C. " intextus Wlk. (*coracellus* Kf.). Keighley, 5/6/25, R.B. Thorner, 25/5/27.
C. (Stictochironomus) rosenscholdi Ztt. Eccup, 18/10/25.
C. (Stenochironomus) flexilis L. Keighley, 29/8/25, R.B. Ilkley, -/6/27.
C. (Glyptotendipes) obscuripes Mq. Ilkley, G.G. Askham Bog, 11/6/17, J.R.D.
C. (Sensu stricto) longistylus Goet. Keighley, 1925, R.B. Leeds, 1925-1927. Common.
C. viridicollis v. de W. Blackmoor, 16/5/26. Ilkley, -/6/27.
C. thummi Kf. Leeds, -/9/26 (det. Goet.).
C. (Cryptochironomus) chlorolobus Kf. Eccup, 19/8/26. Askham Bog, 11/6/27, J.R.D.
C. " albofasciatus Staeg. Ilkley, G.G.
C. " parilis Wlk. (*mucronatus* Goet.). Farnley Park, G.G.
C. " rufinatus Edw., M.S. Ilkley, G.G.
C. (Limnochironomus) nigrimanus Staeg. Keighley, 9/8/25, R.B. Thorner, 28/5/27.
Pentapedilum coracinum Ztt. nec. Kf. Eccup, 19/8/26.

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Birds near Louth.—Goldfinches, Bullfinches, Goldcrest and Magpies have recently been very much on the increase in the Louth neighbourhood.—C. S. CARTER, Louth.

Peppered Moth at Louth.—A gardener recently brought to me a specimen of the black variety of the Peppered Moth (*Pachys betularia* var. *doubledayaria*). As far as I can learn this is the first record of this form for Louth Division 8.—C. S. CARTER, Louth.

Mollusca at Boothby Pagnell.—On Whit Monday I found under stones at Boothby Pagnell, Division 15, along with *Agriolimax agrestis*, a specimen of *Arion intermedius* var. *alba*, which has not previously been recorded for that division.—C. S. CARTER, Louth.

FIELD NOTES.

Otters in the Louth District.—Otters have become much too common to please the anglers in the Louth District, so an otter hunt is to take place.—C. S. CARTER, Louth.

Chærocampa elpenor (Elephant Hawk Moth).—A fine specimen of this moth, captured in a garden in Leeds Road, Huddersfield, was brought to me on the 27th June.—W. E. L. WATTAM, Newsome.

Ceterach officinarum in Lincs.—On Whit Monday I discovered several plants of *Ceterach officinarum* growing on the westerly walls of the ancient Norman manor house at Boothby Pagnell, near Grantham, Division 15. I believe this species has not previously been recorded for that division.—C. S. CARTER, Louth.

Xanthoria parietina Th. Fr.—On April 18th last I found this lichen in a new locality in the neighbourhood of Huddersfield. There was only a small patch. It was growing on a grit-stone wall at the foot of Castle Hill, on its north-eastern side, as one approached the hill from Almondbury.—CHARLES MOSLEY, The Museum, Huddersfield.

Arrhenatherum tuberosum in Lincs.—A friend recently brought me specimens of a bulbous grass from Kenwick, near Louth, Division 8. Through the kindness of Rev. W. W. Mason it was identified by Dr. Druce as *Arrhenatherum tuberosum* (= *A. elatius* var. *bulbosum*). This species, as far as I know, has not been previously recorded for this division.—C. S. CARTER, Louth.

Food of the Wood-Pigeon.—I received from the Rev. C. F. Tomlinson, the Rector of Bolton Abbey, a parcel of roots with the following particulars, viz.: ‘they were taken from the crop of a Wood-Pigeon which was feeding with a fairly large flock on June 20th, in Halton Gill, near Halton East (near to Bolton Abbey, Wharfedale). All the trees in this gill were cut down last year. The substance appears to be a kind of root which a farmer’s son calls “Earth-nuts,” but he could not give any further explanation. There was nothing else in this Wood Pigeon’s crop excepting these “Earth-nuts.” I submitted these “Earth-nuts” to Mr. A. Malins Smith, of the Bradford Technical College, who immediately recognised them as the tuberous roots of the Lesser Celandine (*Ranunculus ficaria*), and he confirmed it by bringing a jar full of the same roots. It surprised me that a Wood-Pigeon, at this time of the year when there is so much new and tender vegetation, should be gorging itself on a very abundant wild plant, and on one which doubtless would be greatly to the advantage of agriculturists if it were much reduced in numbers. Most probably the whole flock was feeding on the same roots, as the full crop of the bird shot contained nothing else.’—H. B. BOOTH, Ben Rhydding.

Depth of Humber Peat.—I have had brought to me a quantity of hazel nuts taken from peat dredged up by the London and North Eastern Railway Company in connection with their work at Salt End, to the east of Hull. They were taken from the peat at thirty feet below low-water at neap tide.—T. SHEPPARD.

The Otter.—We have received a copy of *Cruel Sports*, which is the official journal of the League for the Prohibition of Cruel Sports, with a chapter upon 'Spare the Otter' specially marked. It has been claimed that no sport is cruel if properly pursued. This is an absolute fallacy, and I speak as one who has taken a not inconsiderable part in all British sport. All sport is cruel, and especially the hunting of the Otter. Otters breed in all months of the year, and it is not an uncommon thing for a bitch which is suckling young to be killed. A record of a hunt lasting seven hours, as reported by *The Field*, is referred to. It is only a few years ago that a pack of hounds chevied an Otter round and round the fish pond at Farnley, near Otley, for the same length of time, a most cruel proceeding; and later, much indignation was aroused by Otter hounds killing a bitch and several young ones in Ryedale. Otters certainly do a certain amount of harm to fish life, but they are particularly fond of eels, and in ridding the rivers of these, the greatest enemies to other fish life, they are doing the angler incalculable service. The couplet by Christina Rossetti, with which the article is headed, may well receive the commendation of all lovers of wild life :—

‘ Spare all the harmless creatures of the earth ;
Spare, and be spared, or who shall plead for thee.’

R.F.

—: o :—

CORRESPONDENCE.

THE SEALS IN THE WASH, ETC.

I have just read with much interest your 'Early Yorkshire Mammals.' It is very *sad* reading, however. I do not believe that the beautiful seals you speak of in the Wash, the beginning of the end of which has now, no doubt, begun, have any deleterious effect on the fish—except, of course, those that they happen to catch—for their very abundance must be dependent on the far greater abundance of these, and should be looked upon as an 'All's well!' signal—and *sic de ceteris* as between the preying and preyed upon species. I don't know if the early colonists—Dutch and British—of the Orange Free State, for instance, complained that the lions ate so heartily that they did not leave them enough game for their own tables—though the latter almost hid the plains they fed on. Probably, if they did not say so, it was because no apology was required for killing lions. The cases, as also that of the otter in the days of Sir Isaac Walton, seem to me to be parallel. It is dreadful to think of both it and the badger being doomed to extinction for the sake of cruelty, while the fox, which lives mostly by killing poor people's poultry (a limited supply) is 'kept up' for the very same reason! 'Bad world the while !'—E. SELOUS.

NEWS FROM THE MAGAZINES.

Herbert Mace writes on 'Some Factors in Flower Development,' in *Science Progress* for July.

F. W. Frohawk refers to the scarcity of *Euchlaea cardamines* this year in *The Entomologist* for July.

Excellent illustrations of Lazard's Parrakeet, and of the Golden Eagle, appear in *The Avicultural Magazine* for July.

Professor Fabio Frassetto gives 'Some New Views on the "Down Man" of Piltdown (Sussex)' in *Man* for July.

The Summer Number of *Geography* contains a paper on 'Aspects of the Development of Merseyside,' by P. M. Roxby.

Vol. XII., No. 6, of *Bird Notes and News*, has much to say on Moorland Fires, Oil Pollution and the Soaring Flight of Birds.

Prof. A. E. Boycott has 'Further Observations on the Local Variation of *Clausilia bidentata*,' in *The Journal of Conchology* for June.

Ours, Reckitts' Magazine for June, contains an illustration of a rare Orchid known as *Brassocattleya marsonii alba*. Reckitts' make Brasso!

Larval forms of British *Protura*, New British *Protura*, Mounting *Protura*, and British Gall Midges, are dealt with in *The Entomologist's Monthly Magazine* for July.

Some extra copies of the portrait of the late Arthur Bolles Lee, the author of *The Microtomist's Vade-Mecum*, which was issued with the last number of the *Journal of Pathology and Bacteriology*, are available, and may be had by anyone interested on application to the editor at 17 Loom Lane, Radlett, Herts.

A writer in *Science Progress* states:—'I remain unshaken in my opinion that 500,000 years at least have elapsed since man first trod the soil of East Anglia, and I confess that when I go over, as I have attempted to do in this paper, all the stupendous geological happenings in this area since that momentous event occurred, I stand surprised at the moderation of my estimate. As to exactly when, during this space of time, the various races of prehistoric man existed, I do not feel that our knowledge is at present sufficient to enable us to give a reliable answer. To make some sort of a beginning, however, I would suggest that, so far as Southern England is concerned, Upper Palaeolithic times came to an end about 20,000 years ago; the Acheulean and Mousterian peoples were living here approximately 120,000 years in the past; Chellean man 300,000; while the makers of the eoliths existed at a time separated from the present by at least 500,000 years.' And that's that!

— : o : —

The Elements of General Zoology, by William J. Dakin. London: Humphrey Milford, Oxford University Press, xvi.+496 pp., 12/6 net. The Professor of Zoology at the University of Liverpool will unquestionably add to his reputation by the production of this excellent text-book, which he describes as 'A Guide to the Study of Animal Biology Correlating Function and Structure with Notes on Practical Exercises.' Of text-books on Zoology, of course, there are many, but we must admit that in the present case the author deals with the subject from rather a different angle from that usually adopted. In the past, elementary zoology has been almost too much a study of structure, little attention having been paid to the functions of the structures so carefully described. 'The resultant treatment has thus been incomplete and out of touch with the living reality. In this book an attempt at least is made to do justice to function, while treating it in close inter-relation with the study of structure.' The subject is covered in twenty-two carefully written chapters, illustrated in a way rarely possible in English text-books, on account of the cost. There are 250 well prepared diagrams or excellently produced photographs, which supplement the author's work, and we can rest assured that students of zoology will be grateful to him for the excellence of his volume.

NORTHERN NEWS.

The death is announced of Dr. E. Sidney Hartland, the anthropologist, at the age of 79.

Alderman Edward Wooler, of Darlington, who took a keen interest in local antiquities, died on July 7th.

R. S. Wimpenny favours us with a copy of his 'Observations sur *Danalia ypsilon* Smith,' reprinted from the *Bulletin de l'Institut Océanographique*.

We regret to record the death of Mr. Arthur G. Wright, who had recently retired from his position as Curator of the Colchester Museum, at the age of 69.

Bipinnaria asterigera (Echinoderms), from the Northumberland Plankton, is figured and described by Alexander Meek in *The Proceedings of the Zoological Society* for April.

We learn from the press that early in July 'A sperm whale, the first caught on this part of the coast for nearly 16 years, has been brought in Olinafirth, the only whaling station in Shetland. It was 52 ft. long.'

The Yorkshire Post records that the Dotterel reported to be nesting on the Pennines last year was seen recently on three different occasions by the members of the Barnard Castle School Natural History Society.

The lady curator of a certain museum (the name of which wild horses will not drag from us) has recently been 'interviewed' by the press. The article is headed 'Ambition Realised,' and we are informed she is 'now middle-aged and grey-haired, but trim and efficient.'

Part LXIV. of S. S. Buckman's *Type Ammonites*, contains details of the following three species from the Whitby area:—*Ammonites semicelatus* [now *Kryptodactylites semicelatus*], *A. antiquatus* [now *Schlotheimia antiquata*] and *A. crassescens* [now *Nodicæloceras crassescens*].

A contemporary has arranged tours in London for readers of that journal and several other journals issued by the same publishers. Their scheme has been fully justified, and to prove this a photograph of a group leaving the offices is given. It includes nineteen women and seven men!

The following poem has been sent to us. It may be excellent poetry, but we fear that in reality the 'love' the fish would have for the tadpole would be the same as the 'love' a man has for an oyster:—

When you were a tadpole and I was a fish,
In the Paleozoic time,
And side by side on the ebbing tide
We sprawled through the ooze and slime,
Or skittered with many a caudal flip
Through the depths of the Cambrian fen,
My heart was rife with the joy of life,
For I loved you even then.—LANGDON SMITH.

— : o : —

The Life of the Spider, by J. Henri Fabre. Translated by Alexander Texeira de Mattos, with a preface by Maurice Maeterlinck, xxxi. + 288 pp., Messrs. Hodder & Stoughton, price 2/6. Few of the writings of Fabre, the 'Insects' Homer,' possess greater charm than those in which he relates the lives of the spiders around his Serignan home. The publishers are to be congratulated on including it, at such a cheap price, in the People's Library. Every page is of absorbing interest, and, if Fabre is led occasionally by his imagination to put forward theories which seemingly transgress the bounds of cold fact, we like him perhaps the better for it, since he shows therein his intense humanity. Books of this type must tend to bring about a wider culture, and a more sympathetic attitude towards the study of the lives and instincts of insects and their kin. Our only complaint is that these works of Fabre are not illustrated.

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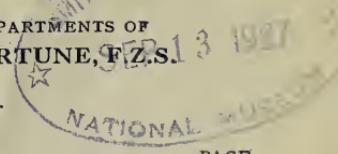
A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

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and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.



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NOTES AND COMMENTS.

PREHISTORIC MAN.*

The writer of this book gives a summary of our knowledge of Prehistoric Man, clearly drawn from certain standard works on the subject. It has been written in simple language, and the author has taken advantage of the illustrations appearing in different places, but in every case he has re-drawn them in black and white, in order to illustrate his remarks. The volume is one of the 'Simple Guide Series,' which title explains its motive and why it is written in non-technical language. Two of the illustrations are reproduced herewith, which are



Fig. 1.—A Mousterian profile, reconstructed principally from the La Chapelle and Le Moustier skulls.

My excuse for this drawing is that prehistoric men are usually made to look like inebriate Bolsheviks, far more dirty and tousled than any ape ever is.



Fig. 2.—A very early Aegean head in marble. Notice the eyes.

fair samples of the author's sketches. We have seen Fig. 1 in Soho, selling curtains!

SOUTH STAFFORDSHIRE COALFIELD.

Probably in no previous memoir has the zoning of the Carboniferous Series played such an important part as in the preparation of that dealing with the Geology of the Southern Part of the South Staffordshire Coalfield (South of the Bentley Faults), by T. H. Whitehead and T. Eastwood, with contribution by T. Robertson, recently issued.† All through, the detailed measurements of different borings and sections have supplied a large amount of information relating to the extent of the various coal measures and the deposits associated with them. Several folding sections appear at the end of the book, upon which these details are given; while in the text, and as plates, are sketches, photographs and other details of typical

* By Keith Henderson. London : Chatto & Windus. xv.+276 pp.
7/6 net.

† London : H.M. Stationery Office. xx.+218 pp. 6/6 net.

sections. There is an excellent map showing the position of the different outcrops in the area. The volume is creditably bound in cloth, and is 'worth it.'

BRITISH ASSOCIATION HONOURS.

The Court of the University of Leeds has decided to confer the following honorary degrees on the occasion of the meeting of the British Association in Leeds:—Doctor of Laws: Sir Arthur Keith, F.R.S., President of the British Association (1927-28); Her Grace the Duchess of Atholl, D.B.E., M.P.; The Hon. Sir Charles Parsons, O.M., K.C.B., F.R.S. Doctor of Science: Dr. John Scott Haldane, F.R.S.; Dr. Nevil Vincent Sidgwick, O.B.E., F.R.S.; Dr. Frederick Orpen Bower, F.R.S.; Dr. Robert Andrew Millikan, California Institute of Technology, Pasadena. Doctor of Philosophy: Mr. James Graham. The graduation ceremony will be held in the Great Hall of the University on Tuesday, September 6th, at noon. Sir Arthur Keith is Conservator of the Museum and Hunterian Professor in the Royal College of Surgeons. The Duchess of Atholl, who comes to Leeds as President of the Education section of the British Association, is Under Secretary at the Board of Education. Sir Charles Parsons has personal and family connections with the West Riding. He was associated many years ago with Messrs. Kitson and Co., the Leeds engineers. Dr. John Scott Haldane, F.R.S., is President of the Institution of Mining Engineers and Honorary Professor and Director of the Mining Research Laboratory in Birmingham University. Dr. N. V. Sidgwick, O.B.E., F.R.S., is a Fellow and Tutor of Trinity College, Oxford, and a University Reader in Chemistry. Professor Frederick Orpen Bower, F.R.S., who is one of the most distinguished of living botanists, is a Yorkshireman by birth and ancestry. Dr. Robert Andrew Millikan, of the California Institute of Technology, in Pasadena, has carried out important researches on the structure of the atom. Mr. Graham, who is the first to receive from the Leeds University the honorary degree of Ph.D., has just completed 21 years' service in the position now known as Director of Education for Leeds.

PECULIAR PLANTS.

The Curator of the Belfast Museum, Mr. A. Deane, in Belfast Municipal Museum Quarterly Notes, No. LI., refers to 'Peculiar Plants.' He says:—'We little realise how much depends upon the activity of green plants for the production of the different articles which we use in every-day life. When we eat a lettuce we consume the green cells which carried on the constructive work, and in the case of eating a potato we devour the stored-up produce of the potato plant. If potatoes are used as food for animals they are transformed into fat.

Grass, like all other green plants, absorbs its food-manufacturing materials from the outside world, and from these it makes food. At the expense of the grass, the weaned calf grows into a cow.'

BIRD'S NEST ORCHIS.

Interesting illustrations from photographs of the rare Orchis (*Neottia nidus-avis*) are given in *The London Naturalist* for 1926 (63 pp., 3/-). The species occur in a number of localities in the Society's area, but in some cases is threatened with



Photo by]

Bird's Nest Orchis.

[*J. E. S. Dallas.*

extinction owing to woodlands coming under the hands of the builders. Mr. J. E. S. Dallas has an article on the subject and says, 'The English name is derived from the plant's roots, which are more or less like the basket-shaped nest of a bird. It is our only saprophytic orchis, obtaining probably the whole of its nourishment from the decaying beech leaves among which it invariably grows. The whole plant, root, stem, bract-like leaves and flowers, is light brown in colour, having no chlorophyll, and is fleshy in texture.' The same journal contains an article by C. Mellows on 'Some Problems of Butterfly Migration'; 'British Willows,' by J. Fraser; 'A

Rare Sawfly (*Pteronidea spiraeae*)' by J. C. Robbins ; 'Insect Vision' by I. H. Burkhill, and other notes.

PLANT AUTOGRAPHS.*

It is safe to say that no modern writer has done so much to excite popular interest in the physiology of plants as Sir Jagadis Bose, who for a quarter of a century has carried out investigations on plants, and published many works recording his observations and deductions. His enthusiasm for this line of research led him to found the Bose Institute of Calcutta, which he equipped with ingenious apparatus, largely of his own designing. He writes in a vigorous and arresting style, in language easily understood, which is unusual in writers of this branch of Botany. His outlook is indicated in some of the Chapter headings : The Silent Life, Plant-Script, Drugged Plants, The Praying Palm of Fardipore, The Curve of Life and Death, Wounded Plants, the Night-Watch of *Nymphaea*, the Propulsive Tissue, Localisation of the Nerves of Plants, the Control of Nervous Impulse, Helios and the Leaf-chariot. From these we may infer that the author has gone far beyond the limits of the orthodox plant-physiologist. He claims to prove that the ascent of sap in trees is due to the activity of a pulsating tissue lying immediately outside the endodermis ; this he likens to a primitive 'heart' in the plant, and that sap flow is due largely to a peristaltic action similar to that of a lower animal. He has much to say about the nerves of plants, and by means of an electric probe claims to show that the phloem is a nervous tissue, and that *Mimosa pudica* has a double system of nerves, internal and external. In the leaf of this plant he has discovered a 'reflex arc' and says that 'the afferent nerve may be described as sensory, and the efferent as motor,' though both produce a similar movement ! Unfortunately, most of the experiments are described so incompletely that the reader is unable to repeat them and test these deductions for himself. There is a portrait of the author, and 120 text illustrations.

ATWICK GRAVEL.

In the House of Commons recently, the President of the Board of Trade was asked whether he was aware of the hardship caused to the inhabitants of Atwick, on the Yorkshire coast, by an order from his department forbidding them to cart away shingle from the shore. Sir Philip Cunliffe-Lister stated in reply that removal of materials at Atwick was stopped as the result of a public local inquiry by the Board of Trade held on January 7th, 1925, at which all bodies and persons interested

* 'Plant Autographs and their Revelations,' by Sir Jagadis C. Bose, F.R.S. Longmans, 1927, pp. xiv.+231, 7/6 net.

were invited to express their views. The reason for the stoppage was that the Board of Trade were advised that they would be likely to lead to serious erosion of the coast in the vicinity, and in fact the inquiry was held as the result of complaints which were received that the removal was causing erosion.

SKETCHING FROM NATURE.*

The Headmaster of the School of Arts and Crafts, Doncaster, has prepared this volume in order to assist the beginner in



endeavouring to interpret nature. A perusal of its pages shows that there is much more in making a sketch than would appear at first sight, and by the aid of illustrations showing where beginners may easily make mistakes in the composition of their drawings, he clearly shows how to obtain the best from a landscape. Several of the illustrations are from his own pen, but he also reproduces other well-known examples by some of the masters. A nature student who nowadays is anxious to take sketches of the scenery or the woodlands he visits, will get much assistance from Mr. F. J. Glass's book. One of the sketches we are kindly permitted to reproduce herewith.

* By F. J. Glass. London : B. T. Batsford, Ltd., ix.+176 pp. 10/6 net.

DEEP SEA ANGLERS.

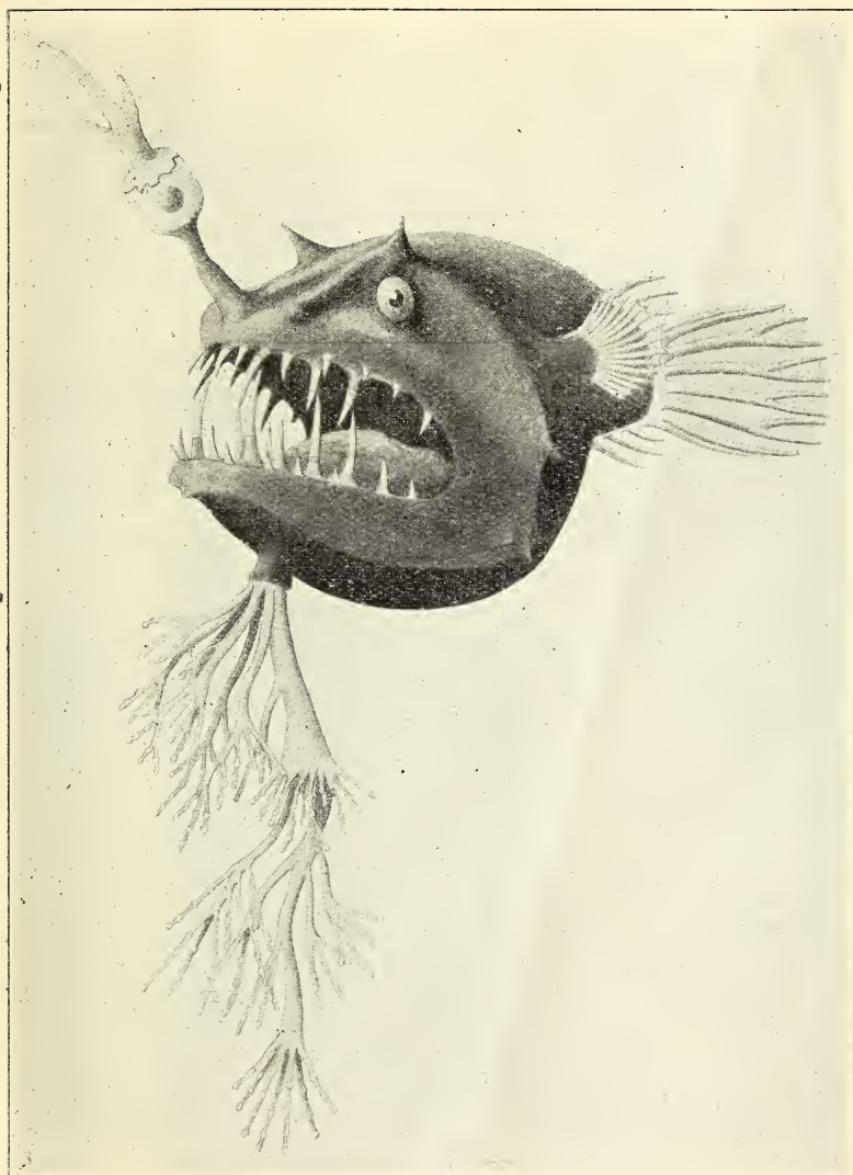
In No. 3 of the *Natural History Magazine*, issued by the British Museum (Nat. History), at 1/-, is a variety of articles, such as 'A Hyaena new to the Exhibition Collection,' by J. G. Dollman; 'Oceanic Angler-Fishes,' by C. Tate Regan; 'Notes on the Evolution of the Voles,' by M. A. C. Hinton; 'Some Strange Relatives of the Frog-Hopper or Cuckoo-spit Bugs,' by W. E. China; 'A Fer-de-Lance's Strange Meal,' by H. W. Parker; 'The Oberthur Collection of Butterflies and Moths,' by N. D. Riley; and 'An Entomological Mystery Solved,' by G. J. Arrow. To our readers, Mr. Tate Regan's notes on the strange monsters of the deep known as Angler Fishes, one of which he described in these pages for February, 1925, will particularly appeal. A restored drawing of the object then figured (*Ceratias holboelli*), a female with a parasitic male attached, accompanies Mr. Tate Regan's notes, as well as the illustration reproduced herewith, by kind permission of the Trustees of the British Museum (page 255), which it seems difficult to believe is a real animate object. From what one hears it might be a representation of the imaginative creations which occur after an excessive dose of alcohol.

THE 'DAILY EXPRESS' AND MUSEUMS.

A series of notes has been appearing in the *Daily Express* relating to the desirability of museums changing their exhibits, and a suggestion has been made that periodically some particular object should be drawn from the museum collections, placed in a central position, and adequately described. In this way the public will have an opportunity of concentrating upon one of the museum treasures from time to time. Following this suggestion, interviews are reported, and, speaking from our own experience, these seem to have been severely sub-edited and distorted in such a way as to be hardly recognisable by the reviewed.

SMALL MUSEUMS.

It is quite possible that in some museums the objects practically remain as they are from year end to year end, with the exception of slight changes due to occasional re-arrangement or additions, but such museums are surely in the minority. In this journal for September, 1923, the present writer dealt with the desirability of having a number of small museums, rather than one enormous institution where a visit meant both physical and mental fatigue, if even a section of the exhibits only were examined. On the other hand, however, a visitor can see fairly well all the exhibits in a small building with comfort, and can retain many of the lessons learnt as a result.



Drawing by]

Linophryne arborifer. **Natural size.**

W. P. C. Tennison.

EXHIBITS CHANGED.

Further, most museums nowadays constantly change their exhibits. For example, during the summer the Wild Flower table is a feature, and this must vary week by week according to the seasonal changes in the local flora. At other times one hears of an exhibition of early printing, of local views, prints and engravings, and so on. Many museums also have large stocks of specimens purposely stored away for exhibition as occasion demands. For example, such events as a Royal Visit, a coronation, the opening of an important new building, or some great street improvement, gives an opportunity for exhibiting objects illustrating similar incidents, and of this the Director nowadays takes advantage. Our Art Museums, also, in addition to their permanent collections, regularly have temporary exhibitions of pictures, prints, sculpture, and so on. It is all very well for one or other of our London papers to get up a 'stunt' of this character, and if the result is that some museums, which hitherto may have been on the 'stodgy' side, are able to improve their methods, all well and good; but, generally speaking, the up-to-date museum director is able to do his duty quite well without the aid of a special anonymous correspondent in the London press.

IN DENT DALE.

In one of his well-written and attractive circulars, prepared by Mr. Jonas Bradley for the Haworth Ramblers, for 'Parish Feast Monday, July 25th,' he gives the following lines, by Mary Hewitt :—

Long trails of cistus-flowers
Creep on the rocky hill ;
And beds of strong spear-mint
Grow round about the mill ;
And from a mountain tarn above,
As peaceful as a dream,
Like a child unruly,
Though schooled and counselled truly,
Foams down the wild mill stream,—
Into the mad mill stream,
The mountain roses fall :
And fern and adder's tongue
Grow on the old mill wall.

—:o:—

A valuable record of the various methods adopted in catching 'fish,' used in its broader sense, as mussel rakes, oyster rakes, and cockle cramsms, are described in 'An Account of the Fishing Gear of England and Wales,' by F. M. Davis (Fishery Investigations, Series II., Sea Fisheries, Vol. IX., No. 6, H.M. Stationery Office, 131 pp., 5/- net). The antiquarian and student of folklore, as well as the naturalist, will find much to interest him in this well-illustrated volume.

THE INSECTS OF EAST YORKSHIRE.*

T. SHEPPARD, M.Sc., F.G.S.

IN the preceding two articles† describing the mammals and the birds of this area, there has not been any necessity to refer to different stages in the life of those animals. Everybody knows that a bird's egg, when hatched, produces chicks, which, immediately they are out of their shell, begin to feed and flourish until they become full-grown.

Similarly, the mammals, whether they be rabbits, foxes, or seals, are born as miniatures of their parents, and while their foods differ as they get older, they still merely get larger until they attain the adult form.

When we come to insects, however, we find a totally different life-history. That is to say, it is not a question of a small fly being hatched from an egg, and feeding and growing into a large one, but the object goes through various changes or metamorphoses from the time it is first deposited as an egg by its parent to the time when it appears as a fully-fledged insect, whether it be a daddy-long-legs, a beetle, a butterfly, or a wasp.

According to the dictionary, the word 'insect' is 'loosely used for a small creature, as a wasp or fly, with a body as if cut in the middle, or divided into sections : (zool.) an arthropod, usually winged in adult life, breathing air by means of trachea, and having frequently a metamorphosis in the life-history.' This, perhaps, does not describe insects in the way likely to be understood by young people. I propose, therefore, to refer to the four main stages in which butterflies and moths exist, in order that some idea may be formed of the way in which these little animals come to be, grow, and reproduce their kind.

Let us take for example the ordinary cabbage butterflies, which are insects. These are well known to school children, and towards the end of the autumn of 1926 there were more of these insects about in the Parks and some of the Avenues around Hull than I ever remember having seen in the whole of my life. On one Sunday afternoon in particular they were so numerous, flying among the flowers and trees, that in some places it gave almost an appearance of a heavy fall of snow. This extraordinary abundance of the Cabbage-White Butterfly was doubtless due to exceedingly favourable conditions, and if that enormous multitude laid the average quantity of eggs, and these have been able to survive the past winter, there should be even more than ever this year. But our 'summer'

* This is one of a series of B.B.C. talks to scholars, dealing with the natural history of East Yorkshire, which we have been asked to print.

† *The Naturalist*, July, pp. 193-199; August, pp. 221-228.

has been a poor one. As may sometimes be seen on leaves or twigs, the butterflies' eggs are deposited in clusters or rows, usually in a place where, when the eggs hatch out by the aid of the warm sun, there will be food for the little caterpillars which emerge.

These eggs themselves are very beautiful microscopic objects. Each particular butterfly or moth (and there are several hundred forms) seems to have a peculiar pattern of egg, just as the egg of a duck differs from that of a partridge, or from that of a sparrow. In butterflies and moths, however, the eggs, instead of being smooth and round or oval, are all manner of beautiful shapes and patterns, some resembling the familiar sea-urchins which one finds on our shores, others resemble very elaborately-decorated wedding cakes, while others are in the form of fancy biscuits, and so on.

The eggs are not large, even being smaller than a pin head, but by the aid of a lens these are shown in perfection, and can still better be seen under a microscope.

After these eggs have been warmed by the sun, or, as sometimes happens, if they get carried into a house by mistake and get into a warm room, they eventually crack and open, in the same way as hens' eggs do when hatched; but instead of a complete butterfly walking out, there appears a very small green, worm-like object. This is what scientific men call a larva, or what is usually known to boys and girls as a caterpillar. Coming from so small an egg they naturally are very tiny at first; but, as already hinted, their parents having chosen a suitable place for the eggs to hatch out, it usually happens that they immediately begin eating, and as gardeners know full well, before long great holes are made in the cabbages or other vegetables as a result of the enormous appetites of these little caterpillars.

The only function of a caterpillar seems to be to eat and to grow. From the moment it is hatched to the time when it ceases to be a caterpillar at all, it does little else than look for food and eat it. In this way, even after a few days, the animals increase tremendously in size. They are provided with 'legs,' some resembling in general shape those of an elephant, by means of which they can crawl about from one plant to another. They vary much in size and shape, according to the different species; some brought in from potato fields are about as large and as thick as one's little finger. These hatch out into the larger species such as the Death's Head Moth, and others. Other of the caterpillars have curious markings, which give them a very ferocious appearance. They are all provided with sharp mandibles, or jaws, for eating.

Being largely soft and juicy in appearance, they are naturally tempting morsels for the birds and other animals which feed

upon them ; consequently they are provided by nature with a protection which gives them an opportunity to live in the great struggle for existence which animals of this kind experience. As already hinted, they are curiously marked ; in some cases they have large black spots like eyes, or are armed with two spike-like appendages resembling tails, and in other ways are somewhat repulsive to look upon. In other instances the colour of the caterpillars so resembles the food upon which they live that they are difficult to detect, while in others, as the well-known Woolly-Bear, or Hairy Caterpillar, the animals are covered with strong hairs which are very distasteful to the birds. Older birds usually leave them severely alone ; but it is amusing sometimes to watch a young bird making a dart, and securing a hairy caterpillar for the first time, and then to watch the way in which it tries to move the distasteful morsel from its beak. Having eventually got rid of it, one can almost see the look of disgust on the bird's face at having tasted such an unpalatable dish, and no doubt it remembers the lesson for the future. Some of the caterpillars are distinctly acrid and bitter to the taste, and are generally unmolested for that reason. The great protection, however, is that of colour. Perhaps the most remarkable instance is our first-named friend the Cabbage Butterfly, where the beautiful rich green of the caterpillar harmonizes with the plant which is its favourite food. So like the cabbage is the caterpillar that, as we probably all know, notwithstanding the vigilance of the cook and the care with which the cabbages are washed in preparation for the meal, there still occasionally appears on our dinner plate a little boiled carcase of a caterpillar which has eluded the eye of birds, cooks, mistresses and everybody else.

To anyone who did not know, it would seem almost incredible that these great caterpillars, which are sometimes two or more inches in length, could have come from an almost invisible egg in the way it does ; but perhaps the next stage in the history of this insect is as remarkable. When the caterpillar becomes full-grown, we find that it seems to get more and more sluggish, grows gradually stouter and larger, finds its way into a hole or crevice in the wall, or buries itself in the soil, and then an extraordinary thing happens. Its beautiful soft skin hardens, dries, shrivels up, and eventually falls away, and inside a miracle has taken place. The animal which previously had its legs, its feelers, its jaws and eyes, has disappeared entirely, and in its place a curious object, neither like the egg nor the caterpillar, nor the insect it has yet to be, takes its place. This is the pupa or chrysalis, the first name being given on account of its resemblance to a doll. These chrysalids vary in shape, size and decoration, just as do the caterpillars and the butterflies and moths. Their hard,

horny covering varies also in shape and character. Sometimes it is a brown conical object, the pointed end of which slightly moves in a small circle on being placed on a warm hand, or being slightly compressed between the thumb and the finger. That is really the tail-end of the insect which still has to appear. The remainder of the chrysalid is a hard leathery mass, and sometimes has a suggestion of the outline of the wings and head of the animal inside. Some of these chrysalids merely remain in the soil until the warm weather transforms them. The others are hidden in crevices or under window-sills, on the posts of wood fences, and so on, where they can remain warm and out of the way of birds.

Some of the species, in addition to protecting themselves in the way described, spin round them a body of silk-like hairs, which is called a cocoon. The way in which one of these apparently sluggish green grubs can make a shroud round itself of beautiful thin material, which in some cases must be yards in length, is marvellous. The 'Woolly-Bears' form cocoons of this kind. In China and other places advantage is taken of the covering of these chrysalids, and the animals usually known as Silk Worms are bred in large numbers for the sake of the cocoons. There the eggs are hatched out, the caterpillars are fed, provision is made for the chrysalids to spin their cocoons, and these are gathered together, and, as was seen at Wembley, placed in hot water, and by a tedious but very interesting process the silk-like hairs are unwound from the cocoons and spun into silk threads, so that our silk handkerchiefs, silk dresses and some of the most beautiful clothes that are worn to-day, are really obtained from the little winter beds made by the caterpillars of that particular moth.

From what has been said it will be understood that the eggs which are laid in the summer-time by the complete butterfly or moth (included in the general term *lepidoptera*), are hatched out by the sun, a certain amount of time is occupied in the feeding of the caterpillars, and then, on being fully grown, the change takes place and the chrysalids make their various efforts to keep warm during the winter. On the arrival of the spring and the warm weather, the chrysalids, which apparently have been dead during the winter months, suddenly begin to show signs of movement, the tail end of the object begins to turn about, the warmer the weather the more lively it becomes, and then we find that the shell of the chrysalid literally bursts. It cracks from end to end, and out of the aperture crawls a curious object which now has long legs; long processes in front of the head, called antennæ; and wings, though on first emerging these are seen to be folded and pressed against the body, and are in a very

soft condition. The animal climbs to a position where it can feel the heat of the sun. Its wings are seen gradually to become loose, and to expand and grow into their full shape, and then they harden, and the animal is able to fly, and see a new world, with eyes very different from those it used when it was chewing cabbages.

I have taken some pains to describe the alterations in the four stages of butterflies and moths; but beetles, flies, ants, midges, bees, wasps, grasshoppers, earwigs and numerous other forms, all pass through similar stages, some perhaps not quite so complicated, others even more so.

Insects may roughly be divided into three sections : those which are useful and helpful to man ; those which are harmful, and do damage ; and those which, so far as we know, are neither the one nor the other.

Certain species of moths and butterflies, for example, do apparently no real harm from the nature of their food, which in some cases consists of wild flowers not used by human beings, and their beautiful colours certainly give added charm to the countryside.

Of the insects useful to man may be mentioned first of all the Silk Worm, which is really one stage in the history of a moth, to which reference has already been made.

All boys and girls like honey. This sweet material is collected from various flowers by the bees, and while the bees really intend that it shall be the food of their offspring when they are old enough to eat it, man allows the bees to collect the honey, and even provides them with homes where it can be stored, and then he takes it from the comb and uses it as a very nice food. The beautiful colour known as cochineal, formerly used extensively in the confectionery trade, is obtained from the cochineal insect, which occurs as a beetle, in plenty, in certain parts of the world.

The Ladybird, which every child knows, and many a time has thrown into the air saying :—

“Ladybird, ladybird, fly away home,
Your house is on fire, your children all gone,”

is a most useful insect. It devours the green-fly, a smaller insect which eats and does so much damage to various crops, the ladybird keeping down their numbers. Large quantities of ladybirds have been exported to certain countries, where they considerably help the nurseryman by eating off the animals which were harmful to his fruit and flowers.

All poultry keepers are aware that chickens are fond of insects of various descriptions, and quite a large industry is now existing in supplying a peculiar type of poultry food which is greedily eaten by the birds, and is stated to be largely made

up of insects. I am not sure what particular insects they are, but in view of the quantity of the material, it is possible that they are locusts or something of that kind, which we know at times are literally so numerous in some countries as to blot out the light of the sun.

Anglers who are fond of catching trout and similar fish know the value of different kinds of flies, and sometimes by means of real flies, and at others by artificial ones, are able to catch the finney occupants of our streams. We know that certain fish rise to certain kinds of flies. Probably many of you have watched the trout rise to the flies in different parts of the district, so that anglers, at any rate, would admit that certain flies were useful. On this subject it seems odd that certain artificial flies, like nothing in nature, are much more tempting to the fish than the natural flies themselves. For example 'Greenwell's-Glory,' an artificial fly made from pieces of birds' feathers, etc., by a late friend of mine, Canon Greenwell, the archaeologist, is like no species known to scientific man, but anglers affirm that it is much more attractive to the fish than any natural fly they can secure. This seems difficult to explain, but doubtless the fish find out, too late, the old adage, 'All that glisters is not gold.' Anglers in our local streams are familiar with the maggots which enable them to secure good catches ; these really are one stage in the history of a species of fly.

In a way, I suppose, one ought to say that butterflies are useful to some men, as certainly several have earned a good living, and are still doing so to-day, by rearing beautiful forms, in confinement, for sale to collectors, Museums, and others, and in recent years our jewellers' shops have been filled with most gorgeous brooches, rings, and other ornaments made from the metallic green and blue wings of some of the foreign butterflies.

When we come to the question of insects which are harmful, it is perfectly amazing what an enormous number there are, which, quite apart from those which may be irritable and annoying, are so destructive that they cost hundreds of thousands of pounds a year to different countries to keep their numbers down, on account of the damage they do to crops of food, cotton, timber, or other materials.

Going back to the early days referred to in the Bible, we hear of the awful destruction caused by the millions of locusts which sometimes occurred in such extraordinary numbers that, as already stated, they darkened the air and cut off the sunlight. These vegetable eaters resemble the grasshopper, and a visit from a hoard of them results, in a short time, of every single particle of green vegetation disappearing, and when they leave, the country looks as though it has been burnt.

A little beetle called the Boll Weevil, which lays its eggs in

that part of the plant which becomes cotton, results in the grub eating away the flower, and causes hundreds of thousands of pounds damage, and the United States of America to-day are spending enormous sums of money in keeping down this pest.

The newspaper scare about arsenic, a deadly poison, being on apples, is an indirect result of the work of an insect. The great apple-growing orchards of Canada, the United States, Africa, Australia, New Zealand and other parts of the world, have insect pests, which, unless kept well in hand, would considerably decrease the yield of fruit. To prevent this the young trees are sprayed with a material which is poisonous, or at any rate objectionable to the small caterpillars, and in this way they are kept off. The small proportion of the poison in the mixture, however, is not likely to be harmful to human beings, and while it may or may not be true that an odd illness is reported as due to the eating of such apples, it can certainly be taken that, generally speaking, there is no danger or fear, especially if before eating an apple one cares to go to the extreme caution of peeling it or washing it in clean water.

All growers of corn are aware of the activities of small Weevils, a species of beetle which under some conditions multiplies to such an enormous extent that they quickly consume large quantities of corn. I have known the time when cargoes of corn coming into Hull could be seen literally to be moving about, so great was the proportion of Weevils among the grain. Another enemy of mankind is the series of insects which infest our forests, and bore into and eat the bark, or the timber itself; or by pupa and adult eating young shoots. Enormous damage is thus done to trees grown for timber. Occasionally, even in this country, one sees whole trees entirely denuded of every vestige of leaf by thousands of little insects which thrive during the warm weather when there has been no rain.

Similarly, I have seen fields in this district in hot summer weather, when the Turnip Beetle, a pretty little beast with yellow stripes, has been so abundant that every vestige of vegetation has been eaten up on several acres of land. I well remember a few years ago passing through such a field in North Lincolnshire, when every trace of green had disappeared, the roots of the vegetable alone remaining, and even they were being attacked, and it was possible in any part of these fields of several acres to gather up forty or fifty of these little insects at a time in one's hands. With these crowds it is understood little can be done, the only salvation the farmer has is a heavy rain shower, which kills them off.

Speaking again of timber, whole books have been written on the ravages of beetles, and this has been shown by the striking example of Westminster Hall, which for several years has been

costing several thousands of pounds to put right. The whole structure was well nigh destroyed by the work of millions of larvae of small beetles. Furniture, floors, and even books, are often not exempt from the harm done by these insects.

A disagreeable animal which does a lot of damage to clothes, curtains, plush coverings to furniture, etc., is that usually known by the ambiguous name of 'Moth.' One knows how frequently it happens that in taking out some garment or carpet which has been stored away for some time, it is found that there are holes eaten through, which ruin the material. These holes are not actually eaten by the moth, that animal merely lays its eggs in the woolly material, and when these hatch out, the small grubs feed upon it until they are full grown, when they turn into small cocoons, which eventually become moths, and so the process goes on.

All Museum Directors have a similar experience with regard to their collections of mammals, birds, etc., and a watchful eye has constantly to be kept upon the cases, as no matter how careful the objects may have been prepared, and how much they have been protected by poisonous matter, the moth occasionally appears, and has promptly to be dealt with, otherwise the fur or the feathers fall from the specimens and they become patchy and useless.

The moths can be detected best by taking a strong light in the room at night time, when they can be seen to rise, though a careful examination of the glass cases reveals their presence, as the first thing a moth does when hatched out is to endeavour to fly into the open, and being unfamiliar with glass, it bumps itself against the pane. Whenever this happens, a little speck of white fluff, which has come from its body and wings, indicates the presence of the animal, and the case should be taken out and dealt with at once.

Another harmful pest is the Mustard Bug, a small beetle which under favourable conditions multiplies to an extent that is almost unbelievable. For many years the land in the vicinity of Sunk Island yielded fine crops of mustard, which were very profitable, and then the demands of the mustard bug eventually became so severe that the entire crops were first partially and then almost entirely destroyed by its ravages. Various methods of coping with it were tried, and finally all mustard growing was stopped for several years, during which the farmers did their best not to allow a single plant to grow, in this way hoping to exterminate the pest by starvation. Somehow, however, sufficient seemed to have been able to persist, and on a fresh attempt being made to cultivate the plant they became as harmful as ever.

Another great nuisance is the common house-fly, which feeds upon and revels among filth of every possible description,

and then calmly walks over our bread and butter, or beef, and leaves harmful germs wherever it goes. There is no question that many diseases, especially among children and younger people, have been caused by the house-fly.

The Mosquito, an almost microscopic object very similar to the gnat, has carried disease from one person to another, and it is only in recent years that studies of its life history have enabled its ravages to be checked. This reminds me that during the early stages of the war I was one of a deputation which waited upon the then Prime Minister, protesting against his suggestion that the Museums throughout the country should be closed. He said that he could not see how the study of, say, Micro-Lepidoptera (this meaning small moths) could be of any benefit to anybody whatever. It so happened that he could not have given a more unfortunate illustration to show the apparent uselessness of Museums, for it was an examination of the smaller forms of insect life which saved the lives of hundreds and thousands of our soldiers during the war, and of white men on the Gold Coast, and other places, where formerly to attempt to reside was almost certain death. The Museums remained open.

—:o:—

Rook's Nest on Church Spire.—The Rook's nest on the church spire at Boston Spa, which has generally survived the winter, was blown away by the high winds last winter. The birds, however, cleverly reconstructed it this year, and have safely reared a brood.—R. FORTUNE.

Curious Nesting Place of Sand Martins.—Briggate, Knaresborough, is a very steep hill descending from the town down to the river. About three parts of the way down, some cottages were being demolished last year. These cottages were built against the cliff side, in which holes had been cut for the insertion of the rafters and beams. In these holes quite a number of Sand Martins had their nests. They do not, however, appear to have returned to them this year.—R. FORTUNE.

Badgers in Sussex.—Staying at Hurstpierpoint, I came across a local man with a decided taste for natural history, and one well acquainted with the wild life of the Downs in the neighbourhood. He is particularly keen in digging out badgers, whom he accuses of destroying both the eggs and young of pheasants, and also of poultry. Since the war he has dug out and killed seventy-three badgers, of which he states at least one in every six was suffering badly with mange, some of them being absolutely covered with sores. I had always considered badgers to be immune from this disease.—R. FORTUNE.

WILBERFORCE HOUSE : ITS HISTORY AND COLLECTIONS.*

(Plate IX.).

A MUSEUM without literature descriptive of its contents is worse off than a social star without press photographs and paragraphs. This, however, is not the complaint of the Hull Museums, whose Director has compiled no fewer than 149 *Publications*, many of which have run through several editions. The latest and handsomest is the new edition (1927) of *Hull Museum Publications*, No. 124, published at the low price of one shilling, which, with its many beautiful plates and text-figures, is even more wonderful value than its predecessor on the same subject published in 1907 at one penny.

The Wilberforce Collection itself includes a remarkable library of literature, comprising what Mr. Sheppard describes as a tremendous collection of books and pamphlets relating to the slave trade, which are gradually being re-bound, as well as several hundred volumes from Wilberforce's own library, with his bookplate and numerous notes in pen and pencil in his own handwriting.

With so grand a theme as the Liberator of the Slave, Hull has an impetus for work and expenditure along the lines set by the Director of its Museums. The volume under review is of universal interest, and will be read by many who have never seen the collection which it records.

Wilberforce House was built *circa* 1580 for the Lister family. When the Wilberforce family became its owners in the 18th century, they added the beautiful Georgian staircase, the fine ceiling, the marble-paved hall, the large room panelled in deal, and the room in which the great Wilberforce was born on 24th August, 1759. At his death in 1833 and burial in Westminster Abbey, his fellow-townsmen followed the custom of the times in providing a monument of massive character at a cost of £1200. A book such as Mr. Sheppard has produced, indicating the devoted research that has gone to the assembling of such a collection, constitutes a memorial more enduring than any other.

In addition to objects associated with Wilberforce is a collection commemorative of the celebrated patriot, Andrew Marvell, of Hull, and an exhibition illustrating the Whaling Industry, in which polar exploration had its beginnings. One of the best of the oil paintings by John Ward (born Hull, 1798 ; died Hull, 1849), representing Hull Whalers in the Arctic, was purchased a few years ago. For correctness in drawing and minuteness of detail, Ward is held to be unsurpassed by any other marine artist. It is reproduced herewith (Plate IX.).

The arts, crafts and industries of the great port, notably glass-making, are appropriately represented as indicating the environment of the distinguished townsmen. The material is, in fact, so rich and abundant, and the compilation of the descriptive lists represents so much application, that the author has not permitted himself room for comment ; but in his brief introduction he happily refers to the Wilberforce Museum in Hull as "a jewel in a setting of iron." Its subject is indeed a gem of many facets :

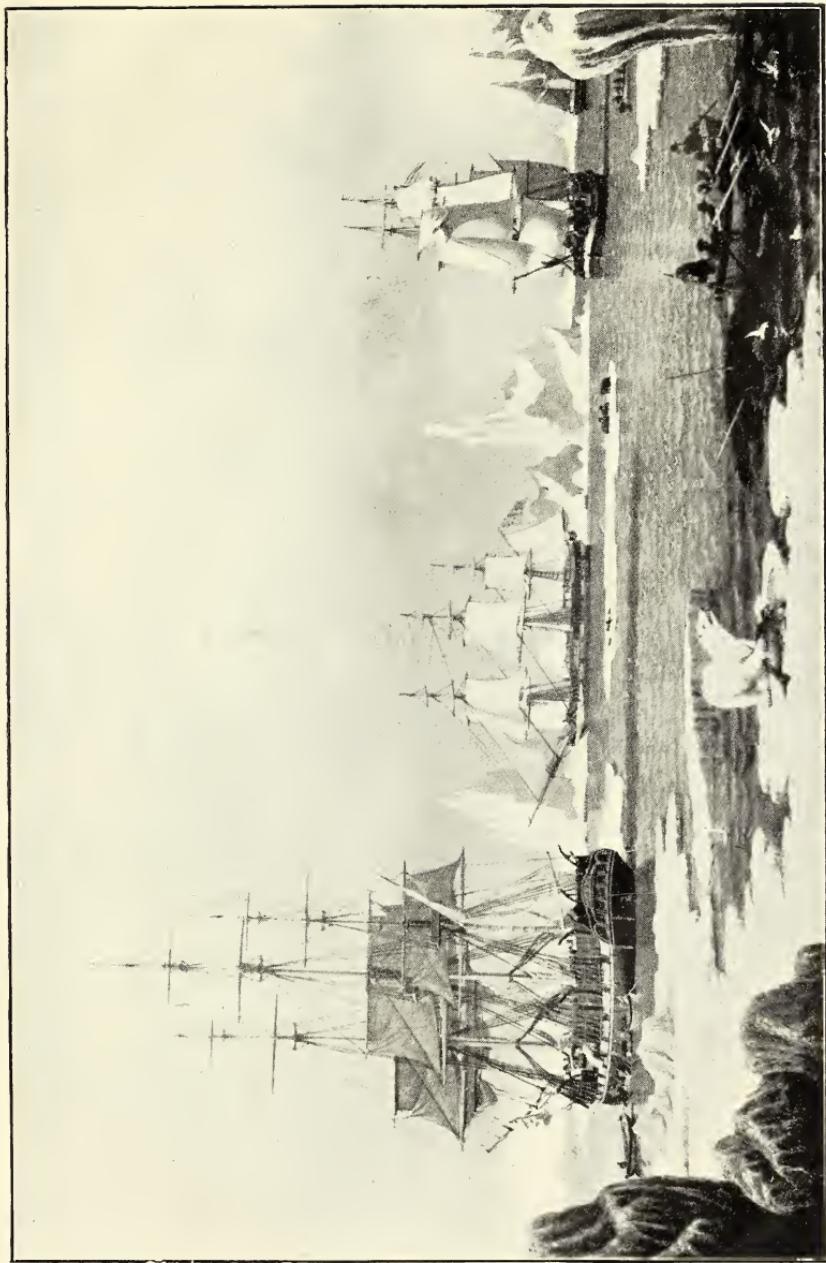
'England owes to him the Reformation of Manners ;
The World owes to him the Abolition of Slavery.'

M. G.

— : o : —

From Mr. T. Petch we have received the familiar annual bundle of valuable reprints, containing particulars of his researches on the Fungi which are harmful to crops. Some day Mr. Petch's good work will properly be recognised.

* By T. Sheppard, M.Sc., Director. 8vo, 88pp., illustrated. *Hull Museum Publications*, No. 124. New Edition, 1927. Price One Shilling.



Hull Whalers in the Arctic.

(From 'Guide to the Willerforce Museum, Hull.')

YORKSHIRE PHYCOMYCETES.

F. A. MASON, F.R.M.S.

SINCE the publication of Massee and Crossland's 'Fungus Flora of Yorkshire' (*Bot. Trans. Y.N.U.*, Vol. 4), in 1905, many phycomycetous fungi have been recorded as new either to Yorkshire, or, to one of the five Divisions into which the county is sub-divided for recording purposes. Some of the records were collected and published by C. Crossland in his annual lists of 'Recently Discovered Fungi in Yorkshire,' contributed to *The Naturalist* during the years 1907-1915; a few were abstracted from various sources by the late A. Clarke, but they were left in manuscript without arrangement or correlation with earlier records. The method of systematising a species to be added to the flora adopted by Crossland was the usual one of annotation with a number indicating the species near to which it should be placed in the 'Fungus Flora.' It would serve no useful purpose to continue to print lists in which this practice is followed, for two reasons, viz., (1) the arrangement of the Phycomycetes adopted by Massee and Crossland is obsolete, and (2) certain of the species included therein are in need of revision with regard either to nomenclature or to the systematic position to which they have been assigned in that work. Similar difficulties arise when considering the later records, and, after the Y.N.U. Mycological Committee had invited me to act as its Recorder, it soon became evident that before anything like an adequate idea of the occurrence and distribution of the Yorkshire fungi could be obtained, a good deal of work apart from mere compilation was necessary, namely, that of a revision of the systematics of the 'Fungus Flora' with which future additions might be correlated.

The present survey of the Phycomycetes includes notes on the taxonomy of certain fungi included in the 'Fungus Flora' itself; an annotated list of additions thereto; and a systematic arrangement of all of the species found in Yorkshire, together with an indication of their distribution within the limits of the recognised Divisional Areas.

In an analysis of the species and their distribution given in the 'Fungus Flora,' page 8, the Phycomycetes of Yorkshire are wrongly stated to number 26 genera and 57 species. That is because three genera—*Protomyces*, *Entyloma* and *Doassansia*—under the heading *Protomycetaceæ*, have been included as Phycomycetes; two of these, of course, are classed as *Hemibasidiæ*, and belong to the *Ustilagineæ*; whilst *Protomyces*, although showing affinities with the Phycomycetes, possesses a multicellular mycelium, and is placed in the family *Ascoideaceæ* of the Ascomycetes. The progress made in our knowledge of

the merely floral aspect of the Phycomycetes, since the publication of the 'Fungus Flora,' is shown in the following analysis :—

	Gen.	Spp.	N.W.	N.E.	MidW.	S.W.	S.E.
" Fungus Flora," 1905 ...	23	48	9	29	23	37	7
August, 1927 ...	28	66	20	41	35	44	10

The following abbreviations are used :—

C.C.=Chas. Crossland. Exc.=An Excursion of the Y.N.U.
F.F.=Fungus Foray. F.Fl.=Yorkshire Fungus Flora, 1905.
Nat.='The Naturalist.'

Square brackets are used to indicate an amplification of data in those cases where the fungus recorded has come under my own notice during Y.N.U. Excursions.

SYNCHYTRIUM ENDOBIOTICUM (Schilb.) Perc.

N.E.—In the Report of the twenty-fourth Fungus Foray, at Sandsend, Sept., 1911, C.C., *Nat.*, 1911, pp. 387-393, the list of additions to the flora of Mulgrave Woods and district includes a species, printed as *Synchitrium solani*, and annotated as new to Yorkshire, which appears to be referable to *Synchytrium solani* Massee. (Geo. Massee : *Diseases of cultivated Plants and Trees*, London, 1910).

The causal organism of the potato disease known as 'Wart Disease,' 'Black Scab,' etc., was first described by Schilberszky, in 1896, under the name, *Chrysophlyctis endobiotica*, from material found in Hungary. The occurrence of the disease in this country was reported by W. Carruthers, and also by M. C. Potter, in 1902; in 1910, J. Percival published an account of the life history and cytology of the fungus, and at the same time transferred it to the genus *Synchytrium*. About that time, however, Massee held the opinion that the fungus found in Great Britain was a species other than the one responsible for the disease reported from the continent, and gave it the name used by Crossland. The specific name, *solani*, has not been adopted by other plant pathologists; Massee himself was present at the Sandsend Foray in 1911, and that must have been one of the few occasions upon which the fungus has been recorded under his name. As a first Yorkshire record it is rather surprising that no mention is made of the host nor of the circumstances in which it was found, although, in the same report Crossland makes special mention of the occurrence of another potato-disease fungus at Sandsend.

S.W.—On potato, Saltaire, 1921, W. P. Winter. A tuber sent to me by Mr. Winter, from potatoes grown on allotments, off Albert Road, Saltaire, was heavily galled by this fungus.

S. *TARAXACI* de By. et Woron.

N.W.—On leaves of *Taraxacum officinale*, close-cropped pasture, Arkle Town, Swaledale, May, 1920; W. Falconer, *Nat.*, 1920, p. 362.

Mid W.—On leaves of *T. officinale*, near Lendrick Hill Plantation, Thorner, Aug., 1922; W. Falconer, *Nat.*, 1922, p. 376. A noteworthy additional record of a species not observed in the Division since 1883, when it was collected in the Washburn Valley.

S. *ANEMONES* de By. et Woron.

N.W.—On *Anemone nemorosa*, Barnard Castle Exc., May, 1918; *Nat.*, 1918, p. 230.

N.E.—On living leaves of *A. nemorosa*, Sandsend, May, 1912 ; C.C., *Nat.*, 1913, p. 27.

S. MERCURIALIS (Lib.) Fuckel

N.W.—On *Mercurialis perennis*, Brignall Banks and Mortham Wood, Teesdale, June, 1911 ; *Trans. Brit. Mycolog. Soc.*, III., p. 296, as *Pycnochytrium mercurialis* (Lib.) Schröt.

N.E.—On *M. perennis*, Helmsley F.F., Oct., 1919 ; A. E. Peck, *Nat.*, 1919, p. 399.

POLYPHAGUS EUGLENÆ Nowakows.

Mid. W.—On *Euglena* spp., Meanwood and neighbourhood, Leeds, previous to 1911 ; H. Wager, F.R.S., *Phil. Trans. Roy. Soc.*, Series B, Vol. 201, 1911, p. 337. Dr. Wager informs me that the Euglenæ with which he experimented in his research 'On the Effect of Gravity upon the Movements and Aggregation of *E. viridis*', *loc. cit.*, were obtained in the locality given above. This is the only record of the species since that of the F. Fl. for N.E. Div.

PHYSODERMA COMARI (Berk. et White) Lagerh.

N.E.—As *Protomyces menyanthis* de By., in F. Fl., where it is recorded as having occurred on living leaves of *Comarum palustre*. Unlike the remaining four species of fungi bearing this generic name, with which it is grouped under *Protomycetaceæ* in the 'Flora,' this plant is a Phycomycete. *Protomyces menyanthis* was at one time believed to occur on both *Menyanthes trifoliata* and *Comarum palustre*, but the form which is found on the last-mentioned plant was described by Berkeley and White as *Protomyces comari* in 1878. De Toni and Massée re-described it in 1888, and named it *Doassansia comari* ; finally, in 1898, Lagerheim showed that the fungus is a Phycomycete belonging to the genus *Physoderma*. The results of a re-examination of the type specimen of *D. comari* de Toni et Mass., and the taxonomy of the species are discussed by J. Ramsbottom, *Trans. Brit. Mycolog. Soc.*, IV., 1916, p. 319.

P. MENYANTHIS de By.

N.E.—On *Menyanthes trifoliata*, Throxenby Mere, nr. Scarborough, 1911, T. B. Roe ; C.C., *Nat.*, 1915, p. 103, as *Protomyces menyanthis* de By. Crossland, *loc. cit.*, has included the occurrence of this fungus merely as an additional host record for this Division, but it follows from remarks on the preceding species that this is the first record of any fungus found in Yorkshire that can be correctly referred to *Physoderma menyanthis* ; it is not known to occur on any other host.

Mid. W.—On *M. trifoliata*, Austwick Bog, nr. Clapham, 1912, M. Malone ; C.C., *Nat.*, 1915, p. 103.

S.W.—On *M. trifoliata*, Filey Exc., May, 1914 ; T. B. Roe, *Nat.*, 1914, p. 253.

ACHLYA RACEMOSA Hildebr.

Mid. W.—On Frog spawn, from pond, Blubberhouses, March, 1926, H. Whitehead. The spawn shown to me by Mr. Whitehead had the appearance of the eggs having been parasitized by a fungus, but there was no evidence that the species found was the cause of destruction ; it is usually regarded as living saprophytically upon decaying plant and animal substances immersed in water. First Yorks. record.

APODYA LACTEUS (Agardh) Cornu

As *Leptomitius lacteus* Ag., C.C., *Nat.*, 1915, p. 103. As pointed out by A. Fischer, *Rabenh. Krypt. Flora : Pilze*, Abt. 5, 1893, p. 372, the old genus *Leptomitius* of Agardh was erected to include water bacteria, such as *Cladothrix*, etc., whereas the organism

known in this country as 'sewage-fungus' undoubtedly belongs to the Saprolegniaceæ. The following Yorkshire records are all based on the observations of J. W. H. Johnson ; C.C., loc. cit. Mid. W.—River Nidd, 1910.

S.W.—Sour pasture, Doncaster, April, 1910 ; R. Don, Ickles Bridge, May, 1910 ; Holme Shay, Bradford, Feb., 1912 ; Halifax, Oct., 1912 ; Wrenthorpe, Wakefield, 1914 ; J.W.H.J., Nat., 1915, p. 48.

PYTHIUM DEBARYANUM Hesse

Mid. W.—On seedlings of *Lepidium sativum* and *Sinapis* sp., Roundhay, Leeds, June, 1916 ; of regular occurrence wherever salad cress is grown.

CYSTOPUS CANDIDUS (Pers.) de By.

N.E.—As *C. candidus* Lév., in F.Fl. This species has occurred in all Divisions, and a noteworthy additional record is that of its occurrence on a new Yorkshire host, *Arabis alpina*, Sandsend, June, 1914 ; C.C., Nat., 1914, p. 252.

PLASMOPARA PUSILLA (de By.) Schrœt.

N.W.—On *Geranium sylvaticum*, Mortham Wood, Teesdale, June, 1911 ; Trans. Brit. Mycol. Soc., III., 1912, p. 296, as *Peronspora pusilla* de By.

P. NIVEA (Unger) Schrœt.

N.W.—On *Aegopodium podagraria*, Dent Exc., May, 1921 ; F.A.M., Nat., 1921, p. 299.

P. PYGMÆA (Unger) Schrœt.

N.E.—On *Anemone nemorosa*, Helmsley Exc., May, 1923 ; F.A.M., Nat., 1923, p. 249.

P. EPILOBII Schrœt.

N.W.—On living leaves of *Epilobium montanum*, Newbiggin, Bishopdale Exc., August, 1922 ; F.A.M., Nat., 1922, p. 385. First Yorkshire record.

S.W.—On *Epilobium montanum*, Abbeydale Hall, Sheffield F.F., Sept., 1924 ; A. E. Peck, Nat., 1924, p. 341.

BREMIA LACTUCÆ Regel

N.E.—[On Lettuce growing in kitchen garden], Duncombe Park, Helmsley F.F., Sept., 1920 ; A. E. Peck, Nat., 1920, p. 403. First Yorks. record.

S.W.—On Lettuce, Abbeydale Hall, Sheffield F.F., Sept., 1924 ; A. E. Peck, Nat., 1924, p. 341.

PERONOSPORA DIANTHI de By.

N.E.—[On leaves of Carnations under glass], Duncombe Park, Helmsley F.F., Sept., 1920 ; A. E. Peck, Nat., 1920, p. 403. First Yorks. record.

P. VIOLACEA Berk.

S.W.—[On flowers of *Scabiosa arvensis*], Ecclesall Woods, Sheffield, F.F., Sept., 1924 ; A. E. Peck, Nat., 1924, p. 341. First Yorks. record.

P. VIOLÆ de By.

N.W.—On leaves of *Viola riviniana*, Dent Exc., May, 1921 ; F.A.M., Nat., 1921, p. 279.

N.E.—On *V. riviniana*, Thornton Dale Exc., June, 1922 ; F.A.M., Nat., 1922, p. 294.

Mid. W.—On leaves of *V. riviniana*, banks of How Stean Beck, Middlemoor Exc., June, 1923 ; F.A.M., Nat., 1923, p. 307. On the same host, Grass Wood, Grassington Exc., June, 1927 ; F.A.M., Nat., 1927, p. 211.

P. SPARSA Berk.

Mid. W.—On living leaves of *Poterium officinale*, Grassington F.F., 1907 ; C.C., Nat., 1909, p. 222.

—On living leaves of *Rosa spinossissima*, Grass Wood, Grassington Exc., June, 1927; F.A.M., Nat., 1927, p. 211.

P. SCHLEIDENI Unger

N.W.—On leaves of *Allium ursinum*, Dent Exc., May, 1921; F.A.M., Nat., 1921, p. 279; on same host, Newbiggin, Bishopdale Exc., Aug., 1922; F.A.M., Nat., p. 383.

P. RUMICIS Corda

N.E.—[On leaves of *Rumex acetosa*], Castle Howard F.F., Oct., 1921; A. E. Peck, Nat., 1922, p. 71. First Yorks. record.
S.W.—[On leaves of *R. acetosa*], Abbeydale Hall, Sheffield F.F., Sept., 1924; A. E. Peck, Nat., 1924, p. 341.

P. POLYGONI Thuem.

N.E.—On leaves of *Polygonum persicaria*, Castle Howard F.F., Oct., 1921; A. E. Peck, Nat., 1922, p. 71. First Yorks. record.
N.W.—On living leaves of *P. aviculare*, Newbiggin, Bishopdale Exc., Aug., 1922; F.A.M., Nat., 1922, p. 385.

P. SORDIDA Berk.

S.W.—On leaves of *Digitalis purpurea*, Wheatley Wood, Doncaster, Sept., 1914; Trans. Brit. Mycol. Soc., V., 1914, p. 17. First Yorks. record.

P. ALTA Fuckel

N.W.—On leaves of *Plantago lanceolata*, Dent Exc., May, 1921; F.A.M., Nat., 1921, p. 279. First Yorks. record.
N.E.—On leaves of *Plantago major*, Thornton Dale Exc., June, 1922; F.A.M., Nat., 1922, p. 294.

P. VALERIANÆ Trail

Mid. W.—[On living leaves of *Valeriana officinalis*], by How Stean Beck, Middlesmoor Exc., June, 1923; F.A.M., Nat., 1923, p. 307. First Yorks. record.

MUCOR Micheli

Under this generic heading the 'Fungus Flora' includes three species and a variety. Of these, only one, *M. mucero*, is entitled to recognition as a valid species; *M. stercoreus*, and the variety *caninus* of *M. mucero*, have both been shown by A. Fischer, Rabenh., loc. cit., p. 189, to be synonyms of *M. mucero*, a view which J. Ramsbottom also takes, Trans. Brit. Mycol. Soc., V., 1916, p. 322. The third species, *M. amethysteus*, is believed by A. Fischer to represent *Rhizopus nigricans*, and, in any case, there is no known species of *Mucor* which is identifiable by Berkley's description of the fungus to which he gave this name. For these reasons the only representative of the genus transferred from the 'Fungus Flora' to the systematic list is the following species:—

MUCOR MUCEO (Linn.) Bref.

MUCOR RACEMOSUS Fres.

N.W.—Collected in Mortham Wood, Teesdale, June, 1911; Trans. Brit. Mycol. Soc., III., 1911, p. 296. First Yorks. record.

N.E.—On Owl pellet (regurgitated), Coxwold Exc., April, 1919; F.A.M., Nat., 1919, p. 209.

Mid. W.—On Malt-wort agar, July, 1927, Leeds. Met with too frequently between the years 1901 and 1927 as a laboratory infection on nutrient media of various kinds. Petri dish exposures in Harewood Woods, 1924-5-6, indicate a fairly regular occurrence of the spores of this species in the atmosphere.

MUCOR CIRCINELLOIDES van Tiegh.

S.W.—In subcultures of aquatic fungi, Wakefield, 1915; J. W. H. Johnson, Nat., 1915, p. 48. First Yorks. record.

SPINELLUS MACROCARPUS (Corda) Karst.

Mid. W.—On *Mycena inclinata* Fr., Byram Park, Selby, F.F., Sept., 1918; *Trans. Brit. Mycolog. Soc.*, VI., 1919, p. 86.

SYZYGITES MEGALOCARPUS Ehrenb.

In F.Fl., as *Sporodinia aspergillus*, for all Divisions except N.W.

RHIZOPUS NIGRICANS Ehrenb. = *R. STOLONIFER* (Ehrenb.) Lind.

Mid. W.—On Tomatoes, Leeds, July, 1927. This fungus occurs quite commonly on food, food materials, fabrics, etc.

THAMNIDIUM ELEGANS Link

Mid. W.—On Caterpillar excreta, Askham Bog, York Exc., July, 1921; *F.A.M., Nat.*, 1921, p. 351.

MORTIERELLA CANDELABRUM van Tiegh.

S.E.—On bark of decaying branch, Escrick, nr. Selby, Selby F.F., Sept., 1918; *Trans. Brit. Mycolog. Soc.*, VI., 1919, p. 78.

M. PILULIFERA var. *PARVISPORA* A. L. Smith.

N.E.—In F.Fl., Appendix I, p. 370, where it appears to have been overlooked when compiling the List of British Phycomycetes, J. Ramsbottom, *Trans. Brit. Mycolog. Soc.*, V, 1916.

ENTOMOPHTHORA MUSCIVORA Schröt.

S.E.—On a large fly attached to the body of a dead stoat suspended in a vermin gibbet, Aldbrough, Oct., 1925; T. Petch, *Nat.*, 1925, p. 368. First British record.

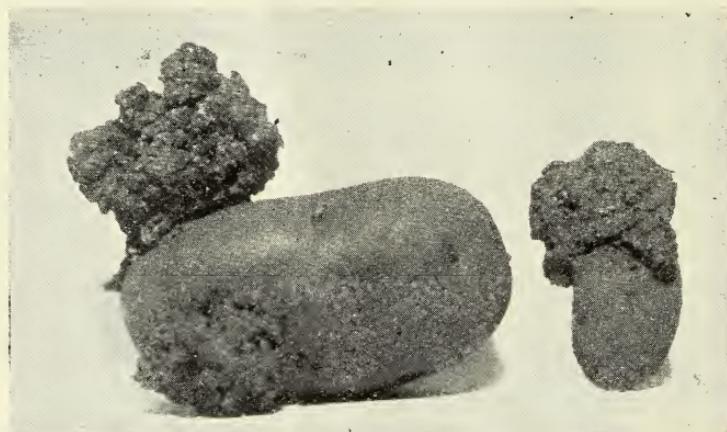
E. SPHEROSPERMA Fres.

S.W.—On *Scatophaga medaria*, Bradford, June, 1921, collected by H. H. Wallis. Specimens of dead flies sent to me by Mr. Wallis were all killed by this parasitic fungus, and were each thoroughly permeated with the organism. The flies were found attached to grasses and other plants during the summer of 1921. This species is known to attack insects belonging to several orders. First Yorks. record.

ADDENDUM.

SYNCHYTRIUM ENDOBIOTICUM (Schilb.) Perc.

Mid. W.—On Potato tubers, allotments, Chapeltown, Leeds, Aug., 1927. A bad attack of this disease, with which, fortunately, few gardeners are familiar, has made its appearance on 'earlies' in Leeds during the present Summer, and the specimens illustrated below are from this source; they represent a stage of the disease before decomposition sets in.



Wart Disease of Potato.

	PHYCOMYCETES.	N.W.	N.E.	MID W.	S.W.	S.E.
	<i>SYNCHYTRIACEÆ.</i>					
1	SYNCHYTRIUM de Bary et Woronin <i>endobioticum</i> (Schilb.) Perc.	...	—	×	×	×
2	<i>taraxaci</i> de By. et Woron. ...	...	×	×	×	—
3	<i>anemones</i> de By. et Woron. ...	...	×	×	×	—
4	<i>mercurialis</i> (Lib.) Fuckel ...	...	×	×	×	—
5	<i>stellariae</i> Fuckel ...	...	—	×	—	—
	<i>RHIZOPHIDIÆ.</i>					
6	PHILYCTOCHYTRIUM Schröter <i>Westii</i> (Mass.) Lemmern. ...	...	—	—	—	×
	<i>RHIZIDIÆ.</i>					
7	POLYPHAGUS Nowakowski <i>euglenæ</i> Nowakows. ...	...	—	×	×	—
	<i>CLADOCHYTRIACEÆ.</i>					
8	PHYSODERMA Wallroth <i>menyanthis</i> de By. ...	...	—	×	×	—
9	<i>comari</i> (Berk. et White) Lagerh. ...	—	×	—	—	—
	<i>SAPROLEGNIACEÆ.</i>					
10	SAPROLEGNIA Nees v. Esenbeck <i>ferax</i> Nees v. Esenb. ...	...	—	×	—	—
11	ACHLYA Nees v. Esenb. <i>racemosa</i> Hildebr. ...	...	—	—	×	—
	<i>LEPTOMYTACEÆ.</i>					
12	APODYA Cornu <i>lacteus</i> Cornu ...	...	—	—	×	—
	<i>PYTHIACEÆ.</i>					
13	PYTHIUM Pringsheim <i>de Baryanum</i> Hesse ...	...	—	×	×	—
	<i>CYSTOPODACEÆ.</i>					
14	CYSTOPUS (Lév.) de Bary <i>candidus</i> (Pers.) de By. ...	...	×	×	×	—
15	<i>cubicus</i> (Strauss) de By. ...	—	—	×	—	—
	<i>PERONOSPORACEÆ.</i>					
16	PHYTOPHTHORA de Bary <i>infestans</i> (Mont.) de By. ...	...	×	×	×	—
17	PLASMOPARA Schröter <i>pusilla</i> (de By.) Schröet. ...	...	×	—	—	—
18	<i>nivea</i> (Unger) Schröet. ...	...	—	—	—	—
19	<i>pygmaea</i> (Unger) Schröet. ...	...	—	—	—	—
20	<i>densa</i> (Rabenh.) Schröet. ...	...	—	—	—	—
21	<i>epilobii</i> Schröet. ...	...	—	—	—	—
	BREMIA Regel					
22	<i>lactucæ</i> Regel ...	...	—	—	—	—
	PERONOSPORA Corda emend. Schröet.					
23	<i>arenariae</i> (Berk.) de By. ...	...	—	—	—	—
24	<i>dianthi</i> (Berk.) de By. ...	—	—	—	—	—
25	<i>viciae</i> (Berk.) de By. ...	—	—	—	—	—
26	<i>violacea</i> Berk. ...	—	—	—	—	—
27	<i>trifoliorum</i> de By. ...	—	—	—	—	—
28	<i>violæ</i> de By. ...	—	—	—	—	—
29	<i>sparsa</i> Berk. ...	—	—	—	—	—
30	<i>affinis</i> Rossmann ...	—	—	—	—	—
31	<i>candida</i> Fuckel ...	—	—	—	—	—
32	<i>effusa</i> (Grev.) Rabenh. ...	—	—	—	—	—
33	<i>grisea</i> Unger ...	—	—	—	—	—
34	<i>ficariae</i> Tul. ...	—	—	—	—	—
35	<i>urticæ</i> (Lib.) de By. ...	—	—	—	—	—

	PHYCOMYCETES—contd.	N.W.	N.E.	MID. W.	S.W.	S.E.
36	<i>Schleideni</i> Unger	×	—	×	×	—
37	<i>parastica</i> (Pers.) Tul.	—	×	×	×	—
38	<i>ruminicis</i> Corda	—	×	—	×	—
39	<i>polygoni</i> Thuem.	×	×	—	—	—
40	<i>sordida</i> Berk.	—	—	—	×	—
41	<i>alta</i> Fuckel	×	×	—	—	—
42	<i>valerianæ</i> Trail	—	—	×	—	—
	ZYGOMYCETES.					
	<i>MUCORACEÆ.</i>					
43	<i>MUCOR</i> Michelii emend. Link <i>mucedo</i> (Linn.) Bref.	×	×	×	×	×
44	<i>racemosus</i> Fres.	×	×	×	—	—
45	<i>circinelloides</i> van Tiegh.	—	—	—	×	—
46	<i>CIRCINELLA</i> van Tiegh. et Lemm. <i>simplex</i> van Tiegh.	—	—	—	—	—
	<i>PHYCOMYCETES</i> Kunze					
47	<i>nitens</i> (Agardh) Kunze	—	×	—	×	—
	<i>SPINELLUS</i> van Tieghem					
48	<i>fusiger</i> (Link) van Tiegh. ... ...	...	×	×	×	—
49	<i>macrocarpus</i> (Corda) Karst.	—	—	×	—	—
	<i>SYZYGITES</i> Ehrenberg					
50	<i>megalocarpus</i> Ehrenb.	—	×	×	—	—
	<i>RHIZOPUS</i> Ehrenberg					
51	<i>nigricans</i> Ehrenb. (<i>R. stolonifer</i> (Ehrenb.) Lind.)	—	×	—	—	—
	<i>THAMNIDIACEÆ.</i>					
52	<i>THAMNIDIUM</i> Link. <i>elegans</i> Link	—	—	—	—	—
	<i>HELICOSTYLUM</i> Corda					
53	<i>elegans</i> Corda	—	—	—	—	—
	<i>PILOBOLACEÆ.</i>					
54	<i>PILAIRA</i> van Tieghem <i>anomla</i> (Cesati) Schröt. ... ...	...	×	—	—	—
	<i>PILOBOLUS</i> Tode					
55	<i>crystallinus</i> (Wiggers) Tode	—	—	—	—	—
56	<i>Kleinii</i> van Tiegh.	—	—	—	—	—
57	<i>voridus</i> (Bolt.) Pers.	—	—	—	—	—
58	<i>œdipus</i> Mont.	—	—	—	—	—
	<i>MORTIERELLACEÆ.</i>					
59	<i>MORTIERELLA</i> Cœmans <i>pilulifera</i> van Tiegh.	—	—	—	—	—
60	<i>pilulifera</i> var. <i>parvispora</i> A. L. Smith	—	—	—	—	—
61	<i>candelabrum</i> van Tiegh. et Le Monn.	—	—	—	—	—
	<i>CHÆTOCLADIACEÆ.</i>					
62	<i>CHÆTOCLADIUM</i> Fresenius <i>Jonesii</i> (B. et Br.) Fres.	—	—	—	—	—
	<i>CEPHALIDACEÆ.</i>					
63	<i>PIPTOCEPHALUS</i> de Bary <i>repens</i> de By.	—	—	—	—	—
	<i>ENTOMOPHTHORACEÆ.</i>					
64	<i>EMPUSA</i> Cohn <i>muscae</i> Cohn ... ...	...	—	—	—	—
	<i>ENTOMOPHTHORA</i> Fresenius					
65	<i>muscivora</i> Schröt.	—	—	—	—	—
66	<i>sphaerosperma</i> Fres.	—	—	—	—	—

FIELD NOTES.

Coot Feeding Young of a previous Brood while Incubating.—Last year I was very much interested in watching the behaviour of a pair of Coots on the old mill pond at Leatherhead, in Surrey. The female was incubating her eggs in a very conspicuous nest, which stood quite a foot above the water level. The male was cruising about with some well-grown young of an earlier brood. Thinking to attract him, in order to photograph him and the young, I threw in some food. He immediately threaded his way through the vegetation, secured the food, and took it to the female on the nest, and she, leaning over the side, fed the young birds with it. This was done time after time.—R. FORTUNE.

Black-headed Gulls and Crossbills near Oldham.—Mr. Fred Allen, of Greenfield, near Oldham, writes that he has received a report from a good ornithologist that about sixty Crossbills passed through Greenfield last week (18th July, 1927). He also complains that someone has played great havoc in the local gulleries this season, by pricking, and thus rendering unfertile, hundreds of eggs. The Gulls have continued to sit until they were tired, and, of course, too late for a fresh hatch. It is, however, satisfactory to know that several scores of nests were missed. Black-headed Gulls are rather apt to become too numerous in certain localities, and in order to keep their numbers within reasonable limits, it is not a bad way to ensure this by pricking the eggs, it involves no cruelty and prevents any undue increase. This is a method which has been advocated by H. B. Booth and myself to check the increase of the Lesser Black-headed Gulls at the Farnes. It may not be uninteresting to note that on a visit to the gulleries at Skipwith Common, this season, I found, instead of all the nests containing full clutches of eggs, the great majority were empty. I thought they must have been raided by collectors, but Morris, the keeper, informed me that a party of about thirty Herring Gulls came over, and they were responsible for the damage, as they cleared out almost every nest.—R. FORTUNE.

Crossbills in Lancashire.—During the second week of July, Mr. Harry Harrop encountered a large flock of Crossbills in the Brushes Valley, near Mossley, and reported it to me. I visited the place on the 14th, and my estimate for the flock was between seventy and eighty birds. Using a field glass, I got very good views of one red male, two or three females, and several immature birds. There are no conifers in this valley, and the flock haunted a wood of dwarf oaks that reaches up right to the edge of the open moor ; to see Crossbills in the haunt of the Red Grouse and Ring Ouzel struck me as extraordinary. Mr. Harrop and others saw the birds eating

caterpillars, and also eating the leaves of the oak. At close range I saw an immature bird bite off and eat an oak leaf. After a few days, the flock dwindled, so that by the 17th there was only a score of birds. Crossbills, sometimes in large flocks, have been reported for July and August this year in many parts of Great Britain. Although many maps place the Brushes Valley (or Swineshaw Valley, to use a common name) in Cheshire, part of the northern side is in Lancashire, owing to an alteration in the county boundaries between Yorkshire, Lancashire and Cheshire. No one seems to know exactly when this change came about, but the "Victoria History" of Lancashire claims and describes the famous prehistoric Buxton Castle as a Lancashire feature, while all the old Cheshire books, and even some of the newer ones, claim it as part of Cheshire.—FREDK. J. STUBBS, Oldham.

Sundews in Cumberland.—Last June, while searching for mosses on some boggy land near Stone Ends, at the northern base of Carrock Fell, we found all three species of *Drosera* growing together. *D. longifolia* was unusually fine and abundant, with *D. intermedia* less so. *D. rotundifolia* was also common, but less striking than the others. It was then, of course, too early for flowers. *D. intermedia* only is reported from this locality in Hodgson's 'Flora of Cumberland,' p. 127. This association of all three species may not be unusual, but we had not met with it previously.—JAS. MURRAY, Gretna.

Lepidoptera near Wigton.—Supplementary to my note in *The Naturalist* (anté p. 74), I now report the following moths:—*Ino statices*, locally common in a damp meadow between Kelsick and Dundraw. *Hepialus humuli* and *H. lupulinus*, common. *Odonestis potatoria*, one near Waver Bridge. *Cilix glaucata* occasional along hedgerows in May. *Bryophila perla*, on walls, common. *Acronycta psi*, *Noctua augur*, and *Phlogophora meticulosa* were frequently met with. *Plusia festucæ*, *P. chrysitis*, and *P. iota* were not rare along hedges from June to August flying at dusk. *P. gamma*, common. I found a freshly emerged specimen of this moth in my garden on 11th November, 1924. *Hypena proboscidalis*, common over nettle beds. *Rumia luteolata*, *Camptogramma bilineata*, *Cabera pusaria* and *Melanippe montanata* were common, while *M. fluctuata* and *M. sociata* were much less plentiful. *Lomasplilis marginata*: several seen. *Acidalia bisetata* not rare. *Emmelesia albulata*, common in hayfields. *Eupithecia rectangulata*, on a window. *Cidaria miata*, rare at light. *Tanagra atrata*, common in meadows, lanes, etc. *Cheimatobia brumata*, common. *Abraxas grossulariata*, only too plentiful. *Alucita hexadactyla*, common in houses.—JAS. MURRAY, Gretna.

REVIEWS AND BOOK NOTICES.

The Geology of the Country Around Wrexham, Part I. (Geological Survey) (London : H.M. Stationery Office; xviii. +170 pp., 4/- net). The interesting area round Wrexham includes Silurian and Carboniferous series, each of which is ably described in the present memoir by C. B. Webb, B. Smith and L. J. Wills, with a contribution by the late G. W. Lamplugh. Besides a key map, it includes illustrations of typical features in the district. There is a chapter on Tectonics, and such questions as drainage, palaeontology, lithology, etc., are discussed.

The Herring and the Herring Fisheries, by Dr. J. Travis Jenkins (London : P. S. King & Son, Ltd., xi. +175 pp., 12/-). Few naturalists have had greater opportunities of studying the economic and natural history conditions of food fishes than has Dr. Jenkins, and in the present volume he deals with perhaps the most important of food fish, the Herring. The life history of the species ; its migrations ; various fisheries, ancient and modern, are described and illustrated. There are various useful appendices, a good bibliography, and excellent illustrations.

Birdroom and Aviary, by Rev. C. D. Farrar (London : F. V. White & Co., Ltd., 311 pp., 6/- net). The former vicar of Micklefield, near Leeds, now in London, has written this work, being the Trials and Triumphs of a Yorkshire Parson, and as a frontispiece is a portrait of the author and his favourite dog, both of which look very 'nice.' After dealing with various bird rooms, the feeding of birds ; vermin, disease and doctoring, he gives a series of chapters dealing with Blue Bonnets, Pectoral Finches, Cat-Birds, Nonpareils, Musky Lorikeets, Rose Pastors, and so on, each chapter beginning with 'My.'

Glimpses of Animal Life, by various authors (London : John Murray, 184 pp., 2/6). We learn from the preface that 'The extracts included in this little book offer no connected study, nor do they follow any settled plan.' After expressing indebtedness to various living authors, the preface goes on : 'And to those who have already passed away—Bosworth Smith, Jefferies, Frank Buckland and Gordon Cumming—we offer the respectful tribute of drawing extensively from their well-known writings. The fact that their books still flourish shows the appreciation with which their writings are studied, and long may this interest continue. Most of the extracts are from copyright books, and in all cases the authors or their representatives have allowed us to reproduce them without fee !' The chapters deal with Lions ; Owls, Gamekeepers' Enemies ; Monkeys ; Otter ; Magpie, etc.

The Abilities of Man : Their Nature and Measurement, by C. Spearman (London : Macmillan & Co., viii. +415+xxxiii. pp., 16/- net). The author says : 'A few lines may be useful to mark out the topic which we are going to consider, and to indicate how this fits into the general order of things. A person is aware of himself as existing in the midst of an external world, or, at least, so it seems to him. He not only perceives this world and himself, but also thinks about both. As a single word to include the processes of both the perceiving and the thinking, modern psychology employs "cognition." But what he thus perceives and thinks about the world and himself, as also about the relations between the two, excites in him activities and states of another kind, such as appetites, aversions, impulses, decisions, voluntary actions, pleasure, sorrow and so forth. All these, to distinguish them from the cognitive processes, are called "conative" and "affective," that is to say, striving and feeling.' In his work he has gathered together the researches of a whole army of helpers, British and foreign, who for twenty years have been carrying on investigations on the lines he suggests. There are numerous chapters, including Eclectic Doctrine ; Proof that G and S exist ; Special Abilities and Group Factors ; Law of Span ; 'Attention' ; Law of Conation W and C, and so on.

Readers of *The Geological Magazine* for the past forty years will have been impressed by a wonderful series of monographs dealing with the mountain structure of central Europe, from the pen of Dr. C. S. du Riche Preller. By the aid of numerous maps and diagrams this author has now issued two volumes on **Italian Mountain Geology** (London : Wheldon and Wesley, Parts I. and II., 194 pp., 7/6 ; Part III., 162 pp., 7/6). The first volume deals with Northern Italy and Tuscany, and illustrates the extraordinary tectonic changes in the area. The second refers more particularly to Central and Southern Italy, where the volcanic rocks have played such an important part in the structure of the area.

The Life of Sir Albert Hastings Markham, by M. E. and F. A. **Markham** (London : Cambridge University Press, x.+261 pp., 15/-net). The name of Markham is well known to naturalists and topographers, and different members of the family have contributed to our literature from time to time. Sir Albert Hastings Markham, the subject of the present memoir, took part in the *Alert* expedition to the North Pole in 1875-6, and he was also in the well-known *Camperdown* and *Victoria* disaster of July, 1893. The Misses Markham, the writers of the volume, describe these incidents fully, and also mention the various ways in which Sir Albert played his part in scientific work, in explorations and in naval matters.

—: o :—

CORRESPONDENCE.

PEREGRINES IN THE EAST RIDING?

In your 'Birds of East Yorkshire' in *The Naturalist*, which I have just read with interest, you note that the Peregrine nested on the cliffs, between Speeton and Flamborough Head; in 1907-1908 and subsequently.

I used to be a Falconer, and joined 'The Old Hawking Club' in 1879, when Mr. Gerald Lascelles was Honorable Secretary. Just before that date, the club owned a tiercel (male Peregrine) which came from a nest on the above-mentioned cliffs, and which was called 'Yorkshire Relish.'

It was thought that the Falcons which bred in 1907 and 1908 became worn out, for at last eggs were laid which never hatched.—W. H. ST. QUINTIN.

SECONDARY LEAFAGE OF OAK, ETC.

Will our botanical members please note the effect of this season's weather on the trees and shrubs.

On oak trees in particular there is a very definite new growth of leaves at the end of the branches, and this can be seen on many other species of trees and shrubs.

I shall be grateful for reports on this matter from every district in the county, so that I can make a statement in our annual report.

The trees and shrubs involved, and the amount noticed in each case, is the type of information that I particularly desire.—CHRIS. A. CHEETHAM, Stone Bridge Mills, Wortley, Leeds.

Answer to correspondent : (W.) Please send something better, if you can, and it shall be printed. For some little time now, due to some cause or other, possibly increasing years, and a general inclination to let others work who may, we have been short of suitable matter for *The Naturalist*, and it has been my unfortunate duty not only to edit the journal, but largely to write it, and really I have quite a lot of other work to do.—ED.

NEWS FROM THE MAGAZINES.

Dr. F. A. Bather, F.R.S., once again takes over the editorship of *The Museums Journal*.

Details of the recovery of various species of marked birds are given in *British Birds* for August.

'The Life Story of a Nightingale,' by George Hearn, is given in *The Animal World* for August.

The Marquess of Tavistock has an illustrated article on Swans in *The Avicultural Magazine* for August.

In *Nature*, No. 3008, Mr. R. W. Gray gives some valuable information relating to the walrus and its method of attacking other animals.

The Presidential Address to the Museums Association, by Mr. J. A. Charlton Deas, of Sunderland, appears in *The Museums Journal* for August.

Ursula Tetley and J. H. Priestley refer to 'The Histology of the Coleoptile in Relation to its Phototropic Response' in *The New Phytologist* for August.

The China Journal for July contains a particularly valuable series of natural history and other observations, and also some useful ethnographical notes.

A photograph of solar prominences and inner corona taken at the Astronomer Royal's observing station at Giggleswick during totality on June 29th, appears in *Nature*, No. 3010.

Notes on the British Neuroptera (with Mecoptera) by W. J. Lucas, appear in *The Entomologist* for August, and in the same journal, H. F. Barnes writes on 'Four British Aphid-eating Gall-midges.'

In *The Irish Naturalists' Journal* for July the editor shows that an alleged mammoth tooth, said to have been found in boulder clay, proves to be the tooth of a modern Indian elephant, which had been burnt when a small museum was destroyed by fire. The strange 'fish' referred to by a correspondent on page 248 we suggest could only have been an octopus.

Dr. Hugh Scott gives some 'Notes on some Foreign Coleoptera imported into Great Britain, and their Biology,' in *The Entomologist's Monthly Magazine* for August. In the same journal is a paper on 'The Ephemeroptera of Yorkshire,' which we think should have been printed in *The Naturalist*, especially as 'the expenses incurred in making the collection have been defrayed by a grant generously made' by a Yorkshire Society.

A note in *Nature*, No. 3012, informs us that: 'The Wild Birds Protection Bill is dead, after the second reading had given promise of a safe passage through the House of Commons. In the opinion of those best competent to judge, it was a measure designed to give better protection to British birds than even the old and scattered Acts, which it was to supersede, had done. But it has been killed by slogans devised by well-intentioned but less well-informed propagandists. It was called a "Rare Birds Protection Bill," yet it protected every bird in the country; it was sneered at because it gave different degrees of protection to different birds, but so long as some birds are persecuted and some are not, it is reasonable that the degree of protection should vary; it was said that the birds would be better off without the Bill, but the statement betrays lack of knowledge of the operation of the present Acts and the particular points on which experience has proved them to be weakest; it was said that public opinion was against the Bill; on the contrary, the informed public were in favour of the Bill. The death of the Bill is to be regretted by all interested in the effective protection of birds in Great Britain, the more so as its disappearance is due to the blind faith of certain members of Parliament in the propaganda of malcontents.'

NORTHERN NEWS.

Mr. A. H. Robeson, of Cheltenham, reports to us that a White's Thrush has been seen at Leckhampton several times this summer.

The Forty-ninth Annual Report of the Art Museum of the City of Nottingham commences 'City of Nottingham, and County of the same City. To Wit, To the City Council.' The report gives a record of the year's good work at the Art Gallery.

Two hundred and fifty-six more pages of Davies Sherborn's wonderful *Index Animalium*, have been published by the British Museum (Natural History). They cover the record of the scientific names *implicatus* to *laminella*, 1801-1850, and form Part XIII. of the Index.

The British Museum (Natural History) has issued a series of picture postcards in colour, of typical British Game Birds, the present series (Set C.19), consisting of Partridges, Pheasants, the Woodcock and the Quail, together with explanatory leaflet (price 1/-, or 1/1 if sent by post).

Professor J. W. Harrison has been elected Professor of Botany at Armstrong College, Newcastle. An old student of the College, he was formerly head of the Science Department, Middlesbrough High School, and lecturer in Zoology at Armstrong College. Later, he was Reader in Genetics.

Sir Courtenay Musgrave has presented to Carlisle Corporation Museum a collection of 300 birds from his ancestral home, Edenhall. 'The collection includes the Greenland falcon, the gowhawk and the hobby birds,' now extinct in the Lake District. Edenhall is the famous country seat associated with the legend of the Luck of Edenhall.

Besides the reports of the various sections, meteorological observations, and an obituary notice, *The Transactions of the Cardiff Naturalists' Society*, Vol. LVII., recently issued, include 'Radyr,' by Charles Morgan; 'Early Photography,' by T. Mansel Franlen; 'Ornithological Notes,' by G. C. S. Ingram and H. Morrey Salmon; and 'Entomological Notes,' by H. M. Hallet.

Some inscriptions on clay tablets and engravings of animals on pebbles, found at Glozel, were considered authentic by Dr. Salomon Reinach. In *Antiquity* for June, Mr. Crawford gives the results of his examination of the objects found and of a personal inspection of the ground. He is satisfied that the objects are forgeries, and Dr. Reinach's theory that a degenerate Magdalenian culture had lasted so late as 4000-3500 B.C. falls to the ground.

In the Calendar of Discovery and Invention, now appearing in *Nature*, we find:—'June 22, 1857.—When the Great Exhibition of 1851 closed, the Commissioners had a balance of about £180,000. With this they bought the tract of land at South Kensington, on which now stand the National Museums and Colleges. The first of these to be erected was the South Kensington Museum, which formed the nucleus of the Victoria and Albert Museum and the Science Museum. The original building, an ugly iron structure long known as the "Brompton Boilers," was opened by Queen Victoria on June 22, 1857. The present Victoria and Albert Museum was opened by King Edward in 1909, while the first part of the new Science Museum is nearing completion.'

As showing the different points of view of the same thing, we give below two accounts of a museum, both given in journals of some standing. The first is the opinion of the person in charge of the collections, the second is that of a person who is visiting the different museums, etc., in the country and giving notices thereon: (a) 'The Museum . . . is justly accredited by competent authorities to be the finest and richest museum of local antiquities outside London.' (b) 'It requires more philosophy than I possess to contemplate without pain the Roman antiquities which are slowly rotting there . . . It is almost impossible to estimate either its value or its importance. It [the collection] is scattered haphazardly about because the premises are inadequate to hold it.'

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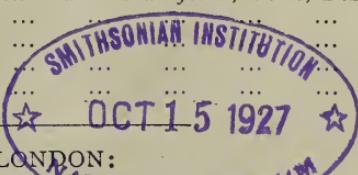
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YORKSHIRE NATURALISTS' UNION.

GEOLOGICAL SECTION.

The Annual Meeting will be held at the Philosophical Hall, Leeds, on Saturday, October 8th, at 6 p.m.

Business :—The Reports of the various Committees.

Election of Officers.

Short Communications by Members.

Exhibits.

H. C. VERSEY, *Hon. Sec.*

BOTANICAL SECTION.

ANNUAL MEETING, October 15th, 3-30 p.m., at The University, 19 De Grey Road, Leeds.

Business :

To nominate Officers for 1928, and to approve the Annual Report.

Members are asked to bring exhibits ; and short papers will be welcome.

CHRIS. A. CHEETHAM,

Secretary.

VERTEBRATE SECTION.

President of the Section :—E. W. WADE, Hull.

Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m., and 6-30 p.m., on Saturday, October 22nd, 1927.

Business at the Afternoon Meeting :—To consider and pass—(a) Sectional Reports for 1927, and to elect Officers for 1928 ; (b) The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee for 1927, and to elect this Committee for 1928 ; (c) The Report of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1927, and to elect this Committee for 1928.

The following papers will be given :—

'The Elusive Salmon,' by C. F. Procter.

'Some Yorkshire Marine Fishes,' (illustrated), by W. J. Clarke, F.Z.S.

Members or Associates are invited to attend and bring notes, specimens and lantern slides. Will Officials of Affiliated Societies kindly notify their members ?

E. WILFRED TAYLOR, *Hon. Sec.*,

10 Telford Terrace, York.

ENTOMOLOGICAL SECTION.

The Annual Meeting of this Section will be held in the Library, Leeds Museum, Park Row, on October 29th, at 3 p.m., and again at 6-30 p.m.

Will Members kindly bring exhibits.

W. D. HINCKS, *Hon. Sec.*

A SPLENDID COLLECTION of BRITISH BIRDS' EGGS, comprising 112 different clutches, in 8-drawer cabinet, each clutch marked with identity cards and data. Reasonable offer accepted. Full details on application. *Apply* : Box No. 107, 'The Naturalist.'

WANTED.—*The Naturalist* for 1915. *Apply* : Box No. 110 'The Naturalist.'



Bird-Rests on St. Catherine's Lighthouse.

NOTES AND COMMENTS.

BIRD RESTS ON LIGHTHOUSES.

Referring to my references to the bird rests on Spurn Lighthouse, appearing in *The Naturalist* for August, page 221, I there stated that these bird rests appeared 'through the efforts of the local naturalists,' and I certainly had and still have reasons for thinking that that statement was correct. Miss L. Gardiner, the Secretary, however, on behalf of the Royal Society for the Protection of Birds, states that it is incorrect, and the perches were erected entirely at the expense of that Society, which also maintains them. In order to give an idea of the nature of these perches, the Society enables us to reproduce the illustration of St. Catherine's Lighthouse, Isle of Wight, which shows the Bird-Rests erected in 1913. (Plate X.).

THE BRITISH ASSOCIATION.

The annual 'Parliament of Science' at Leeds, under the Presidency of Sir Arthur Keith, is now over, and the little stir caused by Sir Arthur accepting Darwinism is settling down for another period. The President's charming manner was much appreciated at the various social and other functions which he religiously attended, even so far as the anthropological and zoological members who visited the St. Leger on the Wednesday! Generally speaking the arrangements for the Leeds meetings were satisfactory; the excursions particularly seem to have been planned with care by persons familiar with organisation, and the reception room was all that could be desired. Those on the platform at the Conference of Delegates had to view the members through iron bars, but otherwise the accommodation was quite good.

THE ADVANCEMENT OF SCIENCE.

This annual publication, containing the Presidential Addresses, was on sale in the reception room,* and was in good demand. In addition to Sir Arthur Keith's address on 'Darwin's Theory of Man's Descent as it Stands To-day,' it contains 'The Outstanding Problems of Relativity,' by Prof. E. T. Whittaker; 'Co-ordination Compounds,' by Dr. N. V. Sidgwick; 'The Tertiary Plutonic Centres of Britain,' by Dr. H. H. Thomas; 'The Ancient History of Sponges and Animals,' by Dr. G. P. Bidder; 'Some Problems of Polar Geography,' by Dr. R. N. Rudmose Brown; 'Rationalisation of Industry,' by Prof. D. H. Macgregor; 'Invention as a Link in Scientific and Economic Progress,' by Prof. Sir James B. Henderson; 'The Englishman of the Future,' by Prof. F. G. Parsons; 'The Development of Human Physiology,' by Dr. C. G. Douglas; 'Mental Unity

* Price 6/-.

and Mental Dissociation,' by Dr. William Brown; 'Some Aspects of the Present Day Investigation of Protophyta,' by Prof. F. E. Fritsch; 'The Broadening of the Outlook in Education,' by the Duchess of Atholl; 'Agriculture and National Education,' by C. G. T. Morison.

GENERAL HANDBOOK.

The General Handbook (288 pp.) was in sections dealing respectively with The Location of Leeds; Natural Science; Early Leeds; The Development of Thought in Leeds; The Modern City; Education; and The Industries of Leeds. Quite a large number of well-known writers had been called upon to contribute to the volume; Dr. C. B. Fawcett, the Reader in Geography at the University of Leeds, was the General Editor, and we should like to congratulate him upon the general success of the Handbook and the wealth of illustration.

HANDBOOKS FOR EXCURSIONS.

A companion cloth-bound volume, or rather cover, contains the handbooks or pamphlets to the various excursions, which, being issued separately, were convenient, as one only had to carry the particular pamphlet relating to the excursion. Handbooks were issued in this form many years ago, but we think the Leeds people are wise in reviving the plan. The excursion handbooks were under the editorship of Mr. H. E. Wroot, than whom it would be difficult to find anyone more qualified for the work. The pamphlets deal with Farnley, Otley; Ilkley and the Moors; The City of York and the Roman Excavations; Harrogate; Byland, Rievaulx and Ampleforth Abbeys; Bolton Priory, Barden and Skipton Castles; Selby Abbey, Birkin Church and Escrick; Wakefield Cathedral and Monk Bretton Priory; Ripon Cathedral and Fountains Abbey; Nidderdale; Tanfield and Middleham Castles, Wensley Church and Thorneborough Prehistoric Camps; Malham and Gordale; The Ingleborough District; Gaping Ghyll and Clapham Cave; Haworth and the Brontes; Aldborough and the Devil's Arrows; and Short Motor Runs from Leeds.

DAILY TIME TABLE.

Another valuable publication, which must have taken a tremendous amount of work in its compilation, was the Daily Time Table, edited by the local secretaries. This gave much information of general interest, as well as an almost hourly time table from 2-30 on August 31st to 12 noon on September 7th, when the concluding general meeting took place at the Albert Hall. By the aid of this pamphlet members could see exactly what was going on at any hour at any section of the meeting.

LECTURES TO SCHOLARS.

To the present writer one of the joys of the Leeds meeting was the experience of listening to Dr. Clarence Tierney give a talk to nearly three thousand school children in the Majestic Theatre, on Tuesday morning, the 6th of September. From the moment Dr. Tierney first spoke, to the moment he sat down, there might have been nobody in that large building, so intensely interested were the scholars and the large number of adults who were present. Using simple language, with a voice that could be heard in every quarter of the room, the lecturer described the metamorphoses of butterflies, mayflies, and other species; the life-history of the stickle-back and other objects familiar to most of those present. The films which he had obtained were remarkable. At 11-45, the Chairman told the scholars that he had arranged with Dr. Tierney to continue lecturing to them until 4 o'clock, without lunch, and on asking them whether they agreed to this, without a moment's hesitation the whole assemblage replied 'Yes, Sir.' They also admitted that they preferred this nature study lecture to cowboys, love scenes, and so on. Apparently the children of Leeds are much better behaved than elsewhere, or else something else is wrong, as we see from *The Daily Mail* and other newspapers which are fond of giving a large number of headings to comparatively small news matter, that at Keighley the children were so inattentive and unruly that Professor Garstang, whose lecture on the 'Songs of Birds' we have all heard, had to close the meeting prematurely.

CONFERENCE OF DELEGATES.

At the first Conference of Delegates of the Corresponding Societies, Sir Francis Ogilvie gave an address on the way in which scientific societies might popularise natural history, and, as he did at the Isle of Man meeting of the Museums Association, he emphasised the importance of maps and mapping in work of this character. At the second conference a paper was read by the present writer on 'Nature Reserves in Yorkshire,' in which he referred to the excellent work being accomplished by the Yorkshire Naturalists' Union at Spurn, Hornsea, Flamborough and other areas. His address was followed by Dr. F. W. Oliver, who referred to Blakeney Point, Norfolk. A good discussion followed. Oddly enough, in the list of societies represented at the Conference, printed by the Association, Yorkshire societies seemed to be conspicuous by their absence, even the Yorkshire Naturalists' Union presumably having no representative present, although he happened to be in the chair at both meetings. An excellent suggestion was made by a well-known member of the Association that the delegates should lunch together, and a prominent

delegate was appointed 'King Lion and Jackal combined,' in order to carry out the arrangements. The delegates, however, seemed to be 'fed up,' and the meal could not be arranged.

PRESERVATION OF WILD FLOWERS.

On this subject the Berkhamstead Citizen Association, in conjunction with the members of the Herts. Natural History Society, made the following suggestions : (1) Education to be forwarded in all the schools teaching children how to value wild flowers and leave sufficient for those who follow them. (2) The enforcement of the bye-law for the protection of wild flowers. (3) That Rangers on the Nature Reserves, and especially on the Ashridge Estate, should be approached with a view of asking them to prevent people taking roots. (4) That the B.B.C. should be asked to give talks on wild flowers and point out that they must have seeds. (5) To approach the cinema companies to ask if they could put an occasional notice on their screens, *re* protection. (6) That the A.A. be approached to see if they will discourage motorists from injury to the woods, etc. (7) That buses coming out to country districts near to London should give warnings to gather moderately, and so educate public opinion.

JOURNAL OF SCIENTIFIC TRANSACTIONS.

Probably the most generally useful publication issued in connexion with the Leeds meeting was the Journal of Scientific Transactions, which contains summaries of the more important papers, and introductions to discussions in the various sections. For press purposes, and also for the use of the members, this journal is invaluable. In past years one frequently wasted a considerable time to hear a paper with an alluring title, which proved to be given by some person or other who was certainly unqualified to deal with the subject. As it is, the summaries given enable an opinion to be formed before one attends a meeting, in addition to which it assists in the preparation of the discussions.

THE CORRELATION OF THE CARBONIFEROUS BEDS OF WESTERN EUROPE, BY W. S. BISAT.

Thanks to the great exposures of goniatite-yielding beds in the Pennine area of the North of England, the zonal analysis of the middle portion of the Carboniferous sequence has been carried out to an extent which enables practically all the goniatite-yielding beds of Western Europe to be correlated easily with some portion of the English sequence. Such correlations have been obtained in Belgium, Holland, Westphalia, North of France and Portugal. They also exist further afield, as in the Sahara and United States. In

Scotland, Northumberland and Silesia the almost complete absence of goniatites makes correlation more difficult, and to a large extent dependent on the broader floral zones. Also for the main portion of the Lower Carboniferous in all districts we are still dependent on the coral-brachiopod sequence. Similarly in the Middle and Upper Coal Measures of the Midland Province of England and the equivalent beds abroad we are dependent for zonal analysis mainly on the freshwater mollusca and the flora. It would, however, appear that, taking the Midland Province of Gibson as a whole, and including in it all the Pennine area south of the Craven Faults, we delimit area extremely suitable for use as a type area. Not only is the sequence approximately complete (including beds not yet recognised elsewhere), but the goniatite-yielding phase is a widespread one, and affords the most delicate index for correlation purposes. Also the exposures at the junction of this phase with the coral-brachiopod phase of the Northern Province are excellent, and offer the most promising avenue yet discernible for a more accurate correlation and explanation of the two great marine facies.

MARINE HORIZONS IN THE COAL MEASURES OF SOUTH WALES
AND THE NORTH OF ENGLAND, BY MISS EMILY DIX AND
DR. A. E. TRUEMAN.

The importance of marine bands as datum planes in the correlation of the Coal Measures has been recognised for some years, and in Nottinghamshire and Yorkshire, and North Staffordshire, several marine bands have been much used in determining the structure of the coalfields. The two most noteworthy are in Mansfield Marine Bed (the Gin or Speedwell band of North Staffordshire) and the First Marine Bed (the Lady Coal band of North Staffordshire). These appear to indicate widespread submergences which affected simultaneously a wide area in the North of England. In the South Wales Coalfield there has been little information concerning marine horizons, but an examination of cores of recent borings has revealed the existence of several well-marked horizons, two of which may be compared with the Mansfield and First Marine Beds. They agree closely in fauna, and they likewise occur near the top of the *Anthracomyia pulchra* Zone. These appear to have been the latest marine episodes in all these areas. Earlier marine horizons are known in South Wales in the *Carbonicola ovalis* Zone and possibly in the *A. modiolaris* Zone.

THE JUNCTION OF THE 'UPPER' AND 'LOWER' CARBONIFEROUS STRATA, BY W. S. BISAT.

The view that the deposition of the Carboniferous beds formed everywhere an unbroken sequence from bottom to

top has long since been exploded, but the exact status of such break or breaks as occur in the succession has still to be determined. It is by no means clear that a twofold division has any physical basis when Western Europe is viewed as a whole. In Yorkshire a considerable break occurs at the junction of the Mountain Limestone and the basal beds of the Millstone Grit, but this break is associated with, and is probably largely caused by, a median ridge in the Carboniferous geosyncline of Northern England. This ridge, elusive though its character may be, served as an effectual barrier between the Midland Province of Gibson, and a Northern Province which included Garwood's North-western Province and the Northumberland-Durham area. From the researches of Tonks and Hudson on this break in Yorkshire at the junction of the Yoredales and the Grits, it would appear that the barrier itself moved northwards in Grit times, and that the Midland Province increased in area at the expense of the Northern Province. Apart from this median ridge with its attendant though obscure phenomena of knoll-reef limestones, breccias and facies-changes, there appears no important break in the North of England succession, except perhaps at the margins of the basins and around the Lake District and the Derbyshire Peak. In South Wales and Somerset there is a much more important break at the junction of the Limestones and Grits, and perhaps to a lesser extent the same is true of Westphalia, though here it is difficult to know how much of the apparent non-sequence is due to lack of exposure or barrenness of the strata.

SOME EPISODES IN THE ' MILLSTONE GRIT ' PERIOD, BY W. S. BISAT.

Thanks to the detailed zonal analysis of the Grits, it is now clear that there were several major outpourings of coarse grit into the deltaic area of the Midland Province, with intercalated marine periods of considerable extent. The earliest such grit invasion appears to be that of the Grassington and Pendle Grits, which form a great thickness of beds extending from North Yorkshire down to Pendle Hill, but are apparently absent further south. The second such invasion was that of the Kinderscout Grit and associated beds, which are of great thickness in Derbyshire, and dwindle away northwards to a few feet near Clapham. Of less importance and not so clearly defined is the invasion represented by the Third Grit of Lancashire, which has a maximum in the west of Lancashire. Lastly, we have the Rough Rock extending in one unbroken sheet perhaps over the entire Midland Province, and in its regular character showing a marked contrast with the preceding great lenticular masses of grit.

THE ZONING OF THE AVONIAN ROCKS IN THE SOUTH OF THE
ISLE OF MAN, BY HERBERT P. LEWIS.

The lower beds (Lower Limestone of Cumming), as developed above the Basal Carboniferous Conglomerate from Cass-ny-Hawin to the east side of Castletown Bay, at Port St. Mary, at Ballasalla and at Ballobot, find their closest parallel in the *Michelinia* and *Productus corrugato-hemisphericus* zones of the N.W. Province as defined by Prof. Garwood. In the *Michelinia* zone, which in places is oolitic, the lowest persistent fossil band is rich in *Syringothyris cuspidata* var. *exeolata* and contains *Athyris glabistria*, *Cyathophyllum multilamellatum*, etc. Higher in these C_2 beds the *Chonetes carinata* band with *Michelinia grandis*, *Clisiophyllum multisepatum*, etc., has been traced from Cass-ny-Hawin to the east side of Castletown Bay. The highest *Michelinia* beds at Ronaldsway contain *Punctospirifer glabricosta*, *Zaphrentis cf. enniskilleni*, and bryozoa. These and associated fossils occur near the base of the limestone and above beds with *Syringothyris* at Port St. Mary. The same band is found at Ballasalla and Ballobot. At Port St. Mary and Ballasalla, immediately above this band, which indicates a low horizon in S_1 , are beds containing mollusca ('gasteropod beds'). At Ballobot the presence of *Nematophyllum minus* *Chonetes papillionacea*, etc., indicates the top of S_2 . In the intervening S beds *P. corrugato-hemisphericus* is found, but fossils are not common.

COAST SECTIONS.

In the coast-section at Stranchnall *Nematophyllum cf. minus* occurs below D_1 beds which yield *Cyathophyllum murchisoni*; a higher band with *Chonetes cf. comaides* is probably near the top of D_1 . Beds near the top of this section contain *Zaphrentis costata* and show analogy to the *Cyathaxonia* beds of Scarlet which are near or at the base of D_2 . The Scarlet-Castletown beds with *Prolecanites compressus* (*Mero-canites*) pass up into beds with knoll fauna at Knockrushen. The knoll limestone (Poolvash Limestone of Cumming) is divisible into two zones: a lower with *Beyrichoceras mucronatum* and *B. vesiculifer*, and an upper with *Goniatites crenistria* and *Beyrichoceratoides truncatum*. Near the base of the higher zone is a coral band with *Dibunophyllum cf. muirheadi*, etc. The black limestone (*Posidonomya* Schist of Cumming) yields *Prolecanites serpentinus*, *Goniatites punctatus*, and *G. falcatus* near the base, below the interstratified 'breccia bed' of knolly limestone which contains *Cyathaxonia*, *Emmonica parasitica*, and small *Michelinias*. Above the 'breccia bed' the black limestone fossils include *Posidonomya becheri*, *G. falcatus*, and goniatites of the *G. striatus* gens.

These lower P_1 beds of Bisat are the highest beds exposed. The Poolvash beds are comparable with those of Cracoe. Wheelton Hind's view that none of the limestone was deposited before D_2 time is therefore considered untenable, as there is evidence of continuous deposition from C_2 until Lower Bowland Shale time. Cutting out of the lower beds between the *Punctospirifer* band and the basal conglomerate at Port St. Mary indicates westward transgression of the C_2 - S_1 sea on to a pre-Carboniferous ridge of land which, it is thought, never became wholly submerged in Lower Carboniferous times.

THE BIONOMICS AND AFFINITIES OF ARCHIPOLYPODA, BY DR.
S. G. BRADE-BIRKS.

Scudder (1882)* in his study of Archipolypoda from the Carboniferous rocks of the United States suggested a possible aquatic habitat for *Acantherpestes major* on the strength of the anatomical features exhibited by the ventral plates. He interpreted the openings seen on a typical ventral plate as a pair of medioventral branchial cups, a more laterally placed pair of openings for the insertion of the legs, and, outside the base of each leg, an oblong-ovate spiracle. Verhoff (1926)† has compared his own interpretation of like structures in *Acantherpestes gigas* with that of Fritsch (1899).‡ Since Jackson and the Brade-Birkses (1919)§ gave their account of *Palaeosoma giganteum*, a new specimen of *Euphoberia ferox* from the Northumberland coal measures has become available for study and for comparison with other specimens of the same species elsewhere, and with the specimen of *Palaeosoma giganteum* preserved in the Manchester Museum. Recent Colobognatha, Thysanura and Symphyla exhibit some structures worthy of comparison with those of the Archipolypoda. This makes a discussion of the bionomics of a number of species possible and helps to throw light upon the origin of the arthropod land fauna. The structure and affinities of the genus *Kampecaris* are considered.

THE SOURCE OF THE CONSTITUENTS OF THE LOWER GREENSAND
AND OTHER APTIAN SEDIMENTS, BY PROF. P. G. H. BOSWELL.

A review of the palaeogeographic features of the British area in Aptian times indicates that the possible land-masses which might have contributed detrital material to the Aptian sediments were (1) the now-buried Palaeozoic floor under the East of England, (2) the south-western Hercynian massif,

* *Mem. Boston (U.S.A.) Soc. Nat. Hist.*, Vol. III., No. 5, p. 155, etc.

† 'Fossile Diplopoden,' in Brom's *Klassen und Ordnungen des Tierreichs*, 2. Abt. 2 Buch, p. 330, etc.

‡ *Fauna der Gashole . . . Böhmens.*

§ *Geol. Mag.*, Dec. 6th, Vol. VI., p. 406, etc.

(3) the western and north-western Palæozoic rocks with their fringe of Jurassic and Triassic strata, and (4) smaller masses of ancient rocks partially buried under newer sediments in the Midlands. The peculiar characters of both coarse and fine detrital constituents of the Lower Greensand, as determined by numerous investigators, indicate that no known British sediments can be regarded as their source. Only newly exposed metamorphic rocks (and probably acid igneous rocks) could have yielded the fresh material of the Greensand. Unfortunately, the older Palæozoic rocks known from deep borings under eastern England are not of a type to satisfy the requirements, nor are those of the west and north-west of England and Wales. The south-western provinces (including Devon and Cornwall and Brittany) may have yielded the detrital constituents, but the coarseness, variety and freshness of the heavy minerals of the Aptian of the northern Midlands and Yorkshire appear to demand a source closer to hand and at present unknown to us. The land-standing puzzle of the source of the Aptian deposits must therefore still be regarded as unsolved.

THE CARBONIFEROUS SUCCESSION IN THE CENTRAL PENNINE AREA, WITH SPECIAL REFERENCE TO THE COUNTRY BETWEEN TODMORDEN, ROCHDALE AND HUDDERSFIELD, BY D. A. WRAY.

The strata usually described as the millstone grits and lower coal measures are typically developed in the Central Pennine area, on the borders of Lancashire and Yorkshire. This area was originally surveyed by the officers of the Geological Survey about sixty years ago : a detailed series of subdivisions was instituted, based largely on lithological considerations. The detailed study of the fossils which occur at numerous horizons was taken up at a much later date, and it was the late Dr. Wheelton Hind who first paid attention to the Goniatites with a view to their establishment as zonal indices. The material then available, however, was insufficient for a thorough study of the group on ontogenetic lines. This has recently been taken up by Mr. W. S. Bisat, who has instituted a zonal sequence based on mutations and species of the genera *Reticuloceras* and *Gastrioceras*. The present writer has geologically surveyed on the six-inch scale more than two hundred square miles of the Central Pennines and has found these zones to have a high stratigraphical value ; by their means a complete correlation of the succession on both sides of the Pennine axis can now confidently be instituted, based entirely on palæontological considerations. The lower coal measures have also been studied in detail and a modified correlation is now presented.

It is further claimed that the Arley Mine, Better Bed, Kilburn and Woodhead coals of Lancashire, Yorkshire, Derbyshire and North Staffordshire, respectively, are of close if not exact contemporaneity, and make a suitable datum line for the subdivision of the upper Carboniferous (with the exception of the uppermost barren coal measures) into two great groups, viz., (1) a lower group, the *Lancastrian* of Bisat (Lanarkian of Kidston), characterised by massive grits, sandstones, and thin coals ; and (2) the *Yorkian* of Watts (Westphalian of Kidston), containing practically all the main productive measures.

PERIODICITY IN THE GLACIAL RETREAT IN WEST YORKSHIRE,
BY DR. A. RAISTRICK.

In the valleys of the rivers Aire, Wharfe, Nidd, Ure, and Swale, of West Yorkshire, the earlier stages of the glacial retreat are marked by lakes impounded in the tributary valleys, and a very complex system of overflow channels cut by the lake waters over the lateral spurs of the valleys, sometimes accompanied by lateral moraines on the main valley slopes. These lakes and channels belong to two main periods of retreat, separated by a short period of readvance of the ice. A third stage of the main retreat is marked by numerous terminal moraines left on the main valley floors by the rapidly retreating and dwindling ice tongues of the valley glaciers. This retreat was frequently interrupted by brief periods of moraine formation, and it has been found that six principal pauses, with corresponding moraine belts, can be recognised, and the moraines are practically complete, in all five valleys. Most of the moraines were breached during the ensuing period of retreat of the ice, and frequently connection can be traced between river terraces and the gorges through the moraines. Comparable terminal moraines in other parts of the Pennines, in Durham and Westmorland, and in parts of Cumberland, suggest that the periodic pause in retreat was due to a climatic periodicity affecting the North of England as a whole.

RECENT PROGRESS IN OUR STUDY OF BRITISH DIPLOPODA (MILLIPEDES) AND CHILOPODA (CENTIPEDES), BY THE REV. DR. S. G. BRADE-BIRKS.

Millipedes and Centipedes ; especially recent progress in the study of British forms. The following subjects are included :—(a) Recent contributions of the Continental workers Attems, Brolemann, Lohmander, Schubart, and Verhoeff to our knowledge of groups and forms occurring in the British Isles. (i.) Attems (1926), ' Progonoata. Chilopoda,' in *Handbuch der Zoologie*, IV. Band (Berlin and Leipzig : Gruyter), reviews the classification of Diplopoda and Chilopoda. The application of his conclusions to British forms is illus-

trated by specimens and diagrams. (ii.) Brolemann (1923), 'Blaniulidae,' *Arch. de Zool. exp. et gén.* 61, 99-453, includes an account of British forms which are exhibited. (iii.) Lohmander in Sweden and Schubart in Germany have recently thrown light upon certain nomenclatural questions. Their conclusions are illustrated by micro-preparations and other specimens. (iv.) Verhoeff (1926), 'Fossile Diplopoden,' in his account of Diplopoda in Brönn's *Tier-Reichs*, deals with the structure of the sternites in Archipolyopoda. British specimens of Archipolyopoda are exhibited to illustrate various interpretations of the features observed, and preparations of recent Diplopoda are added for comparison. (b) The fossil genus *Kampecaris*. A series of specimens and preparations for the comparison of this genus with recent Millipedes. (c) *Brachydesmus* and *Polydesmus*; *Iulidae*: comparisons illustrating the principles of elongation and contraction in phylogeny and ontogeny. (d) The economic status of Millipedes and Centipedes in the British Isles. Diplopoda associated with crops are to be regarded as injurious (e.g., *Brachydesmus superus*, *Blaniulus guttulatus*). Among Chilopoda, Lithobiomorpha are to be ranged with the so-called beneficial insects. How far they are beneficial depends upon the habits of their prey; while certain Geophilomorpha, sometimes carnivorous, may on occasion prove to be a pest to crops.

WHEAT CULTIVATION IN RELATION TO SOIL TYPES ON THE YORKSHIRE WOLDS, BY S. E. J. BEST.

The soil above the chalk on the Yorkshire Wolds is generally very thin, often being not more than six inches in depth. A map constructed from the Parish Returns of the Ministry of Agriculture showing the distribution of wheat in the East Riding shows a greater concentration than would be expected on the eastern flanks of the Wolds. When a line is drawn showing the westward limit of this concentration—a 'wheat line'—it is found to be higher up the sides of the Wolds than is the boulder clay mapped by the Geological Survey. Reference made to Kendall's work on the glaciation of Yorkshire shows that the 'Wheat Line' almost coincides with his probable maximum limit of ice up the eastern sides of the Wolds. The inference is that there are in this area patches of boulder clay and glacial detritus neither deep nor constant enough to be mapped, but still of sufficient importance to be regarded as constituting a definite and distinctive Soil Region, different from the chalk area to the west and the boulder clay area to the east. This is corroborated by personal investigation and by work on the distribution of crops and of population.

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We are pleased to report that our appeal for suitable 'Field Notes' has been successful. But we want more.

WILD CATS ON WESTMORLAND - LANCASHIRE BORDER.

H. W. ROBINSON, M.B.O.U., F.Z.S.S.C.

WE often hear of so-called wild cats of monstrous size and ferocious aspect being killed in different parts of England, notably the north; but all these, on investigation, have proved to be nothing but domestic cats gone wild, or feral cats, *i.e.*, domestic cats which have reverted to feral life, or even been born into it, for it must be remembered that our domestic cat is descended from a foreign imported species from another continent, and not descended from the wild cat of Europe, including Britain. The true wild cat (*Felis catus* or *ferox*) is now confined to Scotland, but has spread of late years to as far south as Perthshire.

Although the Pine Marten still survives in the English Lake District, I had never, in my most sanguine moments, expected to meet with the genuine British wild cat there. In 1922 reports came from the shooting tenant of a wild tract of country on the Westmorland and Lancashire border, not far from Carnforth, of an enormous pair of cats, of which glimpses had been caught at rare intervals. The male had been shot at by a poacher, and probably died of his wounds, as he was not seen again. In the November the tenant, Dr. Fred Hogarth, of Morecambe, had his three dogs driven out of covert and attacked by the female, which he had to shoot to save his dogs from serious injury. Fortunately, he had it preserved and set up, and it may be seen in his surgery in Morecambe. Thus died what is probably the only authentic pair of real wild cats recorded in England for over a hundred years. There seems to be no definite record of wild cats in Lakeland at all, for Macpherson, in his 'Fauna of Lakeland,' gives no definite records, except that William Pearson, writing in 1839, believes that one he saw caught in a snare on Cartmel Fell was genuine. The famous hunter, John Elleray, who died some years previous to the publication of the fauna in 1892, aged well over 90, said that he had been in at the death of more than one wild cat.

A pair turned down near Windermere by a local landowner a few years ago was killed so soon after enlargement that no progeny could have been left. It is quite possible that a poacher shot a pair, in the same place frequented by the pair I have mentioned, in 1920.

The record of the capture of these cats was given by me in the Christmas number of *Country Life* for 1924.

SWALEDALE GLACIAL GEOLOGY.

J. W. GREGORY, D.Sc., F.R.S.,
University of Glasgow.

SWALEDALE has recently attracted attention from its position near the middle line of the solar eclipse, and it has long been a problem to glacial geologists, from the view of Carvill Lewis that the valley and some adjacent moorlands escaped the glaciation which is so conspicuous in most of northern Yorkshire. Carvill Lewis remarked that there is 'no drift whatever here (*i.e.*, on the moors between Dalton and Marske), or in the valley of the Swale' ('Glacial Geology Great Britain and Ireland,' 1894, p. 205), that the country is 'entirely driftless' from Richmond to near Kirkby Ravensworth (*ibid.*, p. 204), and there are no glacial striæ in the Swaledale or about Richmond (p. 206); and his map of North Yorkshire (opp. p. 188) represents the country along the Swale Valley from Reeth to below Richmond, with the moors to the north, and a still longer tract of moorland between Swaledale and Wensleydale as 'unglaciated.' The Swale Valley above Grinton he mapped as occupied by a lobe of ice which entered it from the north-east. J. G. Goodchild ('Outline of Geological History of Upper Swaledale,' *Naturalist*, 1890, pp. 243-7) had previously described the uppermost part of the Swale valley near Keld as having been occupied by a glacier which flowed into it, and after striating the river bed, flowed up the left bank and deposited a sheet of glacial drift as the stagnant ice melted away. Goodchild represented the area as little affected by glacial action; he said that in pre-glacial times 'the valleys and all the larger natural features had been carved out by denudation into nearly the same form they exhibit at the present day.' He remarked the absence from Swaledale of far-travelled boulders (*ibid.*, p. 247). Messrs. Kendall and Wroot ('Geol. Yorkshire,' 1924, p. 535) remark, after reference to Goodchild's 'very early contribution,' that 'the dale, however, has not been investigated since that pioneer work.'

Carvill Lewis had shown his usual acumen by recognizing the glacial occupation of Upper Swaledale as far east as Reeth, and nearly to the Grinton moraine; but further down the valley there is much boulder clay, which Lewis probably overlooked owing to the poverty in natural sections. The Swale flows in the floor of a trench between grass-covered banks, and their form is in many places similar to that of boulder clay; but the sections are few and inconspicuous. The best permanent exposure of the drift I saw near Reeth was in the Arklebeck, opposite the letters 'ec' of 'beck' in the one inch map, where the burn cuts against its western bank, three-quarters of a mile above Reeth Bridge. The section is easily

reached from the Brough Road, at a bend by a house on the eastern side, one-third of a mile north of the Buck Hotel. This section shows a 50 feet bank of hard, tough, dark-brown till, containing boulders, some of them 3 ft. in diameter, and many of them are scratched all over. Some of the pebbles and boulders are angular. All the boulders seen were from the local Carboniferous rocks, although a large selection is exposed on the stream bed.

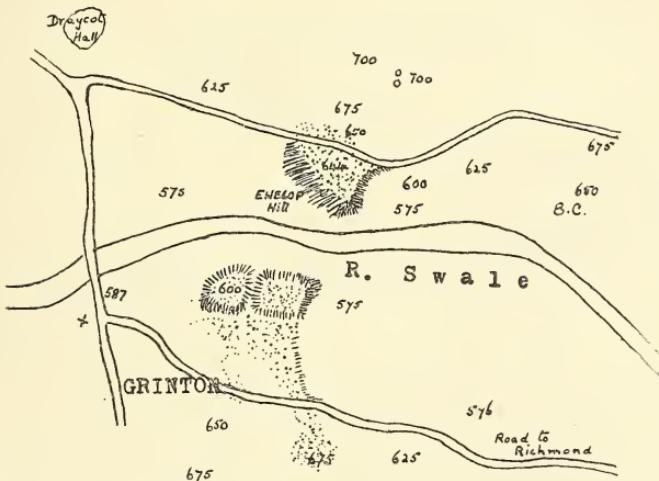
Some excellent exposures have been recently made in road improvements, and as they are temporary, it may be advisable to record their evidence. The new road sections exposed boulder clay at the sharp bend of the road at Hartley Park, about six miles from Richmond.

In Swaledale, above Reeth, the glacial beds have the character of a morainic drift. On the southern side of the Swale, west of Healaugh, beside the bridge on the road to Askriigg, is a steep bank of sandy drift with angular unwater-worn pebbles and boulders, of which the largest measured is $4\frac{1}{2}$ ft. long by $2\frac{1}{2}$ ft. thick. Glacial striae are rare and faint. Most of the boulders are in the upper layer.

A new road, cutting half a mile east of Gunnerside, exposes a sandy unstratified glacial drift with unwaterworn stones and a few scratched limestone boulders. I saw no non-local rock. A better section of this morainic drift has been recently cut a couple of miles west of Gunnerside, just west of a hill road to Askriigg ; the matrix is a sandy loam ; a line of large boulders occurs at the top, with occasional boulders in the lower part ; the pebbles are angular ; the constituents are all local, and none of the boulders is striated. Glacial drifts are abundant along the floor of Swaledale, between Mucker and Reeth ; but the ice appears to be of local origin, and was not sufficiently powerful to modify the valley materially. It is narrow and sinuous, and has overlapping profiles, so that it retains the form of a river-cut valley which has not been materially altered by ice. The adjacent moors, in contrast to the abundant evidence of glaciation to the south in Wensleydale, and to the north in the valley of the Greta from Stainmoor, show surprisingly little glacial influence. The form of Sharroo Hill (1,200 ft.), south of Reeth, from a distance suggested that it had been glaciated ; it is covered by from one to three feet of frost-shattered rubble drift, which gives no trace of glacier action ; the thinness of the drift may be due, as in tropical limestone downs, to the removal of sand and silt by the wind. The only boulders found on this hill were the local Carboniferous limestone and sandstone.

The drifts of Swaledale are so greatly denuded that they appear to belong to an early glaciation. Carvill Lewis was right as concerns the part of Swaledale between Reeth and

Richmond, as to the absence of the glaciation which deposited the many well preserved Yorkshire moraines. The only moraine which I saw in the valley lies across the Dale at Grinton, a mile east of Reeth, close to where Lewis marked the end of his Upper Swaledale ice. The drift there, when seen from the hills, is morainic in appearance. Its best developed portion is Ewelop Hill, which rises 70 ft. above the Swale and projects boldly southward. A couple of small excavations show that it contains many large boulders in an unstratified sandy base. The boulders are angular; none of those seen is striated; it has a sandy not a clay base. The characters are those of morainic drift. On the southern side of the river the moraine forms two lower hills about 25 ft. high,



Scale, 4 inches to the mile.
Dotted = moraine. B.C. = Boulder Clay. Heights in feet.

the form of which has been modified artificially. They have been occupied by an entrenchment which has given them especially steep straight sides on the south. The morainic material passes from them south of the Richmond road to the height of 675 ft., which is about that of the upper part of the moraine on the northern bank of the valley. Four hundred yards E.S.E. of Ewelop Hill a small section in a copse by the river exposes boulder clay. The denudation of the Grinton moraine is similar to that of the adjacent boulder clay, so that there is probably no serious difference in age between them. Both these glacial drifts belong to an early glaciation, during which a local glacier flowed down Arkledale and Swaledale above Reeth, and ended at Grinton. The moraine was probably deposited a little later than the boulder clay, but both belong to the earlier stages of the Yorkshire glaciation.

SOME NEW RECORDS OF SCORPÆNOID FISHES.

A. FRASER-BRUNNER.

ON March the 13th, 1925, a friend of mine, Mr. Emerson Scott, caught a small specimen of *Sebastes dactylopterus*, perhaps the least known of the British Scorpænid fishes, at Saltburn, Yorkshire, and sent it to me. As this locality was considerably farther south than is usually the case with this species, which is most abundant off the coast of Norway, I wrote to Mr. Scott asking him to obtain more if possible. In answer to this he sent another much smaller specimen, taken on the 16th, at a different mark. As it would be a strange coincidence if two accidental stragglers had been taken in this way, it seems to me possible that the species is fairly frequent there, and that it has escaped notice. Both the specimens were young examples, the second being very immature; they are now in the British Museum.

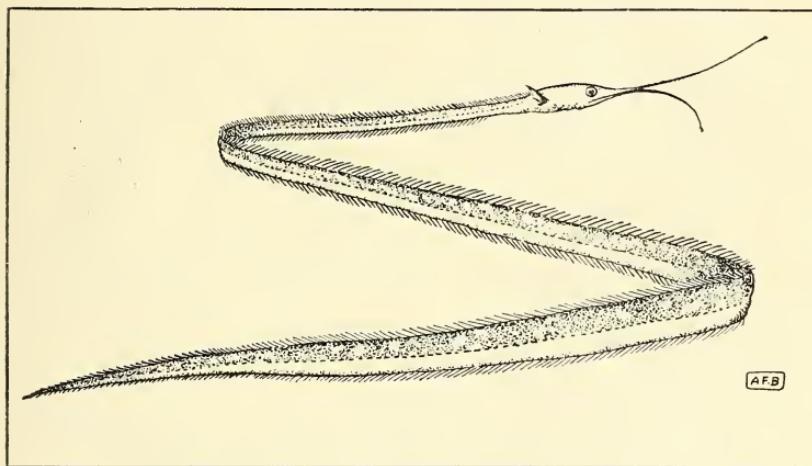
In August of last year, 1926, while trawling off Portland, I secured a small *Scorpaena scrofa*, which, being brought up among a vast number of spider-crabs (*Maia*), was badly damaged. This species being considered very rare on our coasts, on leaving Portland I instructed the fishermen to send me any fish of the kind they should acquire. As a result I received a splendid specimen of the same species in November; it is about eight inches long, in good condition, and well-preserved. This example is in my own collection at present, the first one being in the British Museum.

A specimen of the third of our British species, and the commonest, *Sebastes norvegicus*, was sent to me from Scarborough on July the 1st of this year, and is the first recorded from that locality, I believe. It is small and badly preserved, and strangely, belongs to the small sub-species once known as *S. vivipara*, which, being more northerly than the typical race, is the less likely to be found at such a southerly point.

These records seem to indicate not only that the British Scorpænoids are more numerous than is usually supposed, but that they have a wider range. All my specimens were small, but whether this indicates a migratory habit in the young, or that they are more liable to be carried by the currents, it is unsafe to decide without further investigation.

A Nemichthys from the British Coast.—An example of the deep-sea fish *Nemichthys infans* was sent to me on October 10th, 1926, from Cardigan Bay by Mr. H. Lane, who stated that while motoring from Aberystwyth to Machynlleth he was overtaken by a storm and stayed the night in a hotel at Barth. On going down to the shore in the morning he found the eel, which had evidently been washed ashore during the

night. There can be no doubt as to the authenticity of the record, as it was sent in a fresh condition, not preserved in any way, and bore the Machynlleth post-mark. It is quite intact, in perfect condition, showing no sign of decomposition. The total length from tip of upper jaw to end of tail is sixteen and a half inches, the greatest depth, at the commencement of the posterior third of the body, half an inch. The lower jaw is two-thirds the length of the upper, and both terminate in a knob caused by the flattening of the distal ends of the premaxillaries and dentaries respectively. There are teeth on the



Nemichthys infans from Cardigan Bay. Natural size.

upper surface of the knob of the upper jaw. When fresh, the colour of the parts above the lateral line was dark brown flecked irregularly with creamy, those beneath being lighter; the head was brown, the opercular fold bright green. The intestine contained foraminifera.—A. FRASER-BRUNNER.

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FIELD NOTES.

Mammalian Remains from Holderness Gravels.—

Among a collection of mammalian remains, recently presented to the Hull Museum, from the Burstwick Gravel Pit in Holderness, are several portions of horn cores, skulls, vertebræ and other bones of *Bos primigenius*, portions of large bones, probably elephant, the cervical vertebræ of Rhinoceros sp., cervical vertebra of red deer, small bone of a seal, and a bone of horse. One or two further specimens from the Paull Gravel Pit are also of *Bos primigenius*. In recent years by far the greater proportion of the bones found are referable to this last named species. Mr. W. H. Crofts recently obtained a mammoth tooth in the pit at Paull.—T. SHEPPARD.

Lichens in North-East Cheshire.—Advertising to my note in *The Naturalist*, 1926, p. 283: further working over Rakes Moss, near Crowden, in the early part of August, resulted in the following additional species being noted:—*Cetraria glauca* Ach., abundant on gritstone rocks; *Cetraria aculeata* Fr., on peat; *Parmelia omphalodes* Ach., on gritstone rocks; *Cladonia cervicornis* Ach., *Lecidia granulosa* Schær. and *L. uliginosa* Ach., all on peat; *L. contigua* Fr. and *L. lithophila* Ach., on silicious rocks in the streams.—W. E. L. WATTAM, Newsome.

Grey Squirrel and Pink-footed Geese at Goodmanham.—Goodmanham, at the foot of the Wolds, near Market Weighton, has figured largely in the news of the day owing to its association with the celebrations of the thousandth anniversary of the founding of York Minster. I was greatly interested, when having tea at the Vicarage, to see several Grey Squirrels gambolling on the lawn. The vicar informed me that they had been with them some time, and when hungry would come and knock at the dining-room window until they were supplied with food. The vicar also informed me that Pink-footed Geese were known in the district as St. Michael's Messengers, owing to their regularly appearing on St. Michael's Day.—R. FORTUNE.

Lead Pipe perforated by *Sirex gigas*.—A leakage of gas in a newly-built house in Oldham led to an examination of the fittings, when a circular hole was found in one of the pipes. The pipe was attached to a joist, and the perforation agreed exactly with a similar hole in the adjacent timber. From the timber projected the head of an insect, confidently identified by one of the workmen as a 'death watch beetle.' Subsequently, other similar insects were found projecting from the timber. A piece of the pipe, and three of the insects were brought to me the same day. The insects were 'Wood Wasps,' or 'Giant Tailed Wasps' (*Sirex gigas*), fully mature, but unexpanded. I was told that the onrush of gas when the pipe was connected had killed these insects, but to me it seemed that they had been dead for some days at least. A close examination of the perforation under the microscope convinced me that the work had been done by minute curved strokes of some tool about as hard as one's finger nail. The wall of the pipe is nearly one-eighth of an inch thick, and the actual orifice is somewhat less than a quarter of an inch in diameter. The house was built, and the pipes fitted in the early part of the year. Apparently, the timber was heavily infested, for other holes were noticed. By most unusual coincidence, no fewer than three of the emerging insects found themselves faced with the lead pipe. Had the gas been already on, they would

no doubt have been poisoned as soon as the minutest orifice had been made ; and such a leak would have passed unnoticed. As it happened, they had plenty of time during the season of emergence to dig entirely through the wall of the pipe—but the hole is just too small for the insect to pass. Rats are well known as, on occasion, gnawing through lead pipes or sheeting ; but damage by insects must be very rare in England, although known in other countries. The present case is so unusual a combination of chances that we can hardly list *Sirex gigas* as an enemy of lead pipes ; nevertheless, there must always be risk of damage when gas or electric fittings are placed touching new timber in the early part of the year.—FREDK. J. STUBBS.

Crossbills near Oldham.—The Crossbills mentioned in *The Naturalist* for September were still in our district in good numbers on Sept. 3rd. I saw numerous small parties, and in every case they were feeding on the ground underneath the oak trees. Each party contained both mature and immature birds.—FRED ALLEN.

Plusia moneta in Yorkshire.—During the first week in August, *Plusia moneta* was taken by my wife on the house door and brought to me. This, and another which I took from a spider's web on an old wall which surrounds the grounds of the sanitorium at Eldwick, near Bingley, a few years ago, are the only ones I have taken.—E. P. BUTTERFIELD.

Tachinidæ on Allerthorpe Common.—The following species of the parasitic flies of the family Tachinidæ have been determined for me recently by Mr. C. J. Wainwright. They have all been taken at Allerthorpe. New to the county are : *Melinda cærulea* Mg. (*gentilis* Sch.), *Lypha dubia* Fln., *Zenillia pexops* B. and B., a rare fly, *Onesia agilis* Mg., and *Gonia ornata* Mg. New to the East Riding are : *Acrophaga alpina* Zett., a northern and uncommon species, *Phryxe nemea* Mg., and *Wagneria lenti* Mg.—W. J. FORDHAM.

Boletobia fuliginaria in Yorkshire.—On Aug. 28, Mr. W. Buckley, of Skelmanthorpe, obtained in an out-house at his residence a fine male *Boletobia fuliginaria*. This species, always a rarity in Britain, does not seem to have been previously recorded for the midlands or the north of England. According to South, with the exception of one taken at Crome, in Worcestershire, all the other British examples have been taken in the London district. The late Mr. W. H. Tugwell reared four moths from caterpillars found feeding upon a black, sooty-looking fungus, determined by Dr. M. C. Cooke as an effused Muscedine growing on rotten wood, but no fungus of any description seems to be growing where Mr. Buckley found his specimen.—B. MORLEY.

Gaultheria shallon at Greenfield.—This Ericaceous shrub was recently observed in good flower on the moors near Greenfield. Probably bird-sown from a garden specimen.—FRED ALLEN, Greenfield.

Oolitic Plant Remains from N.E. Yorkshire.—For the benefit of future workers, it should be recorded that the various specimens of Oolitic plants described by Mr. J. J. Burton, of Nunthorpe, in his different published papers, have been presented to the Geological Section of the Hull Municipal Museum. The collection includes typical specimens from Marske, Roseberry Topping, Gristhorpe, and Cloughton. The Marske and Roseberry Topping specimens were collected in company with Mr. Hamshaw Thomas, who described the specimens in *The Naturalist* for May, 1913. Specimens figured by Mr. Hamshaw Thomas elsewhere are also in the Museum.—T. SHEPPARD.

Arnoseris minima, Schw. and Koerte, near Pocklington, E.R. Yorkshire—a new County Record.—On the excursion of the Union to Allerthorpe, East Riding of Yorkshire, on the 2nd July, 1927, Mr. F. A. Mason made the very important discovery of *Arnoseris minima* on a sandy stretch of land near the Common. The first specimen which Mr. Mason gathered was lost, but in early September he revisited the locality and noted this plant well established there. I received specimens on the 6th of September in full flower. The larger plants growing in its vicinage are *Cytisus scoparius* and *Ulex europaeus*, while the ground flora associated with *Arnoseris* consists of *Crepis virens*, *Calluna vulgaris*, *Gnaphalium sylvaticum* and *Filago minima*, of which I have seen specimens. I sent a specimen of the plant to the Director of Kew, who kindly confirmed the identification. Neither Baker's 'Flora of North Yorkshire,' nor Fraser Robinson's 'Flora of the East Riding,' makes any mention of this plant, but in Lee's 'Flora of West Yorkshire' there is a very old and unconfirmed record of its occurrence 'in some barren fields in Yorkshire.' As this statement is so extremely indefinite, and has not been verified for nearly 300 years, we must consider that Mr. Mason's discovery establishes a new record, not only for the East Riding, but for the County. *Arnoseris* has been found in twenty-four Watsonian vice-counties in *Topographical Botany*.—R. T. FLINTOFF, Recorder, E.R.

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Volume XXV. of *The Annals of the South African Museum* contains illustrated memoirs on Arachnida, by R. F. Lawrence; Mollusca, by J. R. le B. Tomlin; Freshwater Entomostraca, by G. O. Sars; Cephalopoda, by Anne L. Massey; and Bryozoa and Nudibranch Mollusca, by K. H. Barnard.

RECENT WEATHER AND THE COMMON GNAT.

CHRIS. A. CHEETHAM.

THE dampness of July and August has, in some districts, been very favourable to this gnat (*Culex pipiens* L.). A recent visit (September 6th) to Rawdon Crag Wood helped one to realise what the species can do when weather conditions are suitable. Normally fair numbers are present, and in most sweepings of the net odd ones are found, but on this occasion the vegetation, shrubs, grass or ferns, held countless myriads of this and practically only this insect; a conservative estimate would give them as 99 per cent. As one moved along through the lush growth due to the same cause, the extra moisture, clouds of these gnats flew up on all sides.

Although there in such numbers, none attempted to bite, and the only trouble of this nature came from the mosquito *Anopheles plumbeus* Steph., which breeds in the holes of trees. These made a steady attack, generally singly, when one sat down or ceased moving about.

I have noticed for some years that at home at Farnley no one ever complains of being bitten by these common gnats, and I know we have them in plenty. In winter they come into the cellars to hibernate in hundreds, but they are quite harmless. I have also noted that at Crag Wood they do not attack one, the biters there being *Anopheles bifurcatus* L., *A. plumbeus* Stph., and *Finlaya geniculata* Ol.

In the past I have often assumed the common gnat to be the trouble, and I have seen it so stated by others in our magazine.

Austen, in 'British Blood-sucking Flies,' says: 'This species is often a troublesome blood-sucker.'

Edwards, however, writing in *The Bull. Entom. Research*, 1921, says: 'It will certainly attack man, but can seldom be regarded as troublesome; I have never myself experienced its bite, nor found a blood-gorged female in a bedroom. In South Europe, however, the reports of various observers lead one to suppose that it is more regularly addicted to feeding on human blood.'

In the *Faune de France* Mon. E. Seguy states that it is 'Agressif.' So we must assume that our northern representatives have learnt better manners than those of the south coast, or of the continent.

The worst species we have in Yorkshire is the so-called wood gnat, *Ochlerotatus nemorosus* Mg., on the 'commons' of East Yorkshire, or the 'mosses' of the North and West, where it is always in evidence and abundant. With me the

results last for a week or so, but I have known cases where the trouble recurred for two or three weeks.

The common gnat can be distinguished from the others by the stumpy body of the female ; the rest have a more or less pointed abdomen. The males have thin tapering palps, which are up-turned at the end ; other species which have up-turned palps have them thickest towards the tips. In both sexes the venation of the wings is a good guide, in the gnats two veins fork towards the tip of the wing, in the common gnat the uppermost fork is much the longer, and it has a very short stem ; these two forks are approximately equal in the others.

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The Life of the White Ant, by Maurice Maeterlinck (London : G. Allen & Unwin, Ltd., 213 pp., 6/-). The life of the white ant is probably one of the most extraordinary stories that could be told about any of our smaller animals, and none better than the present author could give so fascinating a narrative. The book has been translated by Alfred Sutro, and certainly will appeal to our readers.

Report on the River Wharfe carried out in August, 1925, by Dr. E. Jee. Issued by the Ministry of Agriculture and Fisheries and the Standing Committee on Rivers Pollution (1921). Report No. 110. Serial No. 147.

The results furnished by a series of tests, made during the above investigation, have provided Dr. Jee with material for a report of 26 typescript pages. That the test adopted is unsuitable, the findings contradictory and conclusions accidental, are obvious.

At present there is no single test which can afford a reasonable index to the degree and extent of river pollution, and yet Dr. Jee, solely upon determinations of the oxygen concentration, claims to have established such a guide to stream condition. Unfortunately, the test adopted is profoundly influenced by local topography, temperature, aquatic vegetation, and even the hour of the day.

The suggested oxygen requirements of trout, given on page 10, are hardly supported by observations later in the report, where it will be noticed that trout were absent when oxygen was most plentiful, but found in the less favourable conditions of the noted fishing stretches. From this it will readily be understood that it is not scientifically feasible to draw the desired conclusions from this test ; even with extended observations the application of other laboratory determinations appears essential. It may be mentioned that the Yorkshire Rivers Investigation Committee, assisted by the West Riding Rivers Board, did not on any single occasion find conditions similar to those reported by Dr. Jee, although they have spent fourteen months on their survey. Their findings suggest a much more satisfactory average stream condition than that which appears to have obtained on the occasion of Dr. Jee's visit ; in fact, the water both at Grassington and Pool was normally supersaturated, and the average amount of oxygen in solution at these places was identical. Although, of course, the dissolved oxygen is less lower down the stream, even at Ulleskelf, it only decreased about 12 per cent., though the pollution was greater.

It is much to be regretted that this Ministry has hitherto devoted so much time to this unsatisfactory superficial type of investigation, whereas a few well-directed investigations, carefully performed, could add so much to our knowledge of stream pollution problems.—J. W. H. JOHNSON.

ALLERTHORPE COMMON.

F. A. MASON, F.R.M.S., AND T. STAINFORTH, B.A., B.Sc.

THE 335th Excursion of the Union was held at Allerthorpe, near Pocklington, on Saturday, June 2nd. This date proved to be one of the rare fine days experienced during the present summer, and a representative gathering of naturalists, including the President (Wm. Falconer) and Dr. S. J. Gayner (York), spent a very enjoyable and wholly profitable day on the Common, or in its vicinity.

A General Meeting was held at Headquarters (Barmby Moor Café) in the evening, the President occupying the chair. Reports on the work of the day were received from the President and Messrs. A. A. Dallman, W. D. Hincks, Greevy Fysher, F. A. Mason, C. F. Procter, T. Stainforth, and W. E. L. Wattam. A cordial vote of thanks was accorded to Capt. H. Whitworth for permission to visit his estate, and to the Local Secretary (T. Stainforth) for the excellent arrangements which had been made for the excursion. Eleven affiliated societies were represented at the meeting.

It is 32 years since the Union as a whole visited Allerthorpe Common, and in view of the extraordinary wealth and interest of its fauna and flora, the compilers have considered it desirable to include an account of the general and physical features of the district, and it is hoped that, from time to time, workers will forward to *The Naturalist* accounts of their work in the district to supplement the records here given.

THE DISTRICT.—To the naturalist, Allerthorpe Common is a place of infinite charm. Here, within sound of the mechanical traffic on a highway to York, he finds a large area of virgin ground where the plants and animals are probably much as they were in more primitive times. In these days of intensive agriculture, one wonders how long our few nature reserves will remain undisturbed, and whether members of the Yorkshire Naturalists' Union, in a century to come, will read with regret in its journal of glories that are past. Would that such wise council should prevail in high places, that areas like Allerthorpe Common might be preserved in perpetuity for those who love wild life.

It is to its soil of unfertile ferruginous sands that this Common exists as such. These sands, occupying an embayment between the High Catton and Escrick moraine of the Vale of York glacier on the west, and the Boulder clay fringe at the foot of the Wolds escarpment about Pocklington on the east, are derived from the disintegration of Trias. Forming part of the deposits of the great Lake Humber, they were possibly distributed by the action of southward-flowing currents. The present hummocky nature of the surface of the Common might lead one to suspect that its configuration is due to later dune formation, as was long ago suggested for a similar area at Cliff.

Some parts of the Common are peculiarly arid, and destructive fires, traces of which can be seen, occasionally destroy the heather and the associated plant and animal life. Marshy hollows exist which support a contrasted faunal and floral association. As might be expected, Scots Pine and Birch trees thrive in such a soil, and these, together with the Heather, Cotton Grass, and other associations, account for the richness of the insect life. In places the soil is peaty, but nowhere is the peat apparently of more than a few inches in thickness.

FLOWERING PLANTS (A. A. Dallman):—There were many features of interest both to ecologists and systematic botanists. The soil in places was obviously markedly calcareous, and this was well illustrated in fields traversed by a footpath between Allerthorpe and the main road. The fragrant inflorescences of *Habenaria* (= *Gymnadenia*) *conopsea* occurred here in abundance, together with a profusion of certain other calcicole species, amongst which were *Plantago media* and *Primula veris*, the last in fruit. Arenicolous plants were well represented in many places, and one sandy

tract skirting the Common was white with bloom of the dominant Corn Spurrey, while abundance of *Scleranthus* was also noteworthy. Among other arenicole species were *Ornithopus perpusillus*, *Papaver rhæas*, *Cytisus scoparius*, *Erodium cicutarium*, *Plantago coronopus*, and *Teesdalia*.

Genista anglica was encountered on the Common, and was fruiting well. *Salix repens* was quite a plant of the Common, and the damp ground yielded a number of hydrophytes, which included *Potentilla comarum*, *Hydrocotyle*, *Veronica anagallis*, *Valeriana dioica*, *Drosera rotundifolia*, etc. The Marsh Cinquefoil hereabouts was infested by numbers of beetles, which were feeding on its foliage. This insect was identified by the entomologists as *Galeruca tenella*.

Mr. Mason found a single specimen of *Arnoseris pusilla**—a distinctive little Composite with its inflorescence axes curiously expanded towards the summit—which was new to many of the party. *Sisymbrium sophia* proved a puzzle to some, but its presence on such sandy soil was hardly surprising. *Chelidonium majus* and *Geranium pratense* also occurred in various places. It was interesting to see what a hold *Matricaria suaveolens* (= *discoidea*) had in the neighbourhood. It was abundant for miles along the margins of the main road, and also along the lane from Allerthorpe to the Common. This aromatic American alien has made remarkable headway of late years, and it seems to be so energetic and ubiquitous as to excel the familiar *Elodea* in its colonising efforts.

MOSSES (W. H. Burrell) :—As the records for this area are meagre, a full list is given of the mosses seen. The vegetation is influenced by the low elevation of Derwentland ; pools and marshy places favour a swamp flora, while at slightly higher levels the sandy alluvium favours peat and sand plants. Rye, as a crop, and Sand Spurrey, as a rampant weed of cultivation, indicate the nature of the arable land. The adjoining parishes of Melbourne and Sutton-upon-Derwent were also examined ; the water-side pastures, such as the Ings and the canal side at Sutton, with their lush herbage, were almost devoid of mosses ; the best collecting grounds being roadside swamps and ditches, heathy tracts with timber, and the masonry of canal locks, where a few rupestrial species were seen. A couple of hours were spent on Skipwith Common, about two miles west of the Derwent, to search for *Goodyera repens* and *Dicranum undulatum*, two rarities whose only recorded Yorkshire station is a similar sandy area about twelve miles distant. The orchid was not seen, but several cushions of *Dicranum undulatum* were found, associated with *Dicranum scoparium*, *D. spurium*, pine, birch and heather, as at the Market Weighton station. When swollen with moisture the cushions so closely resemble the common *Dicranum scoparium*, with which they grow, that they would have been passed unnoticed but for the definite effort to find them.

In the following list A = Allerthorpe Common ; M = Melbourne ; S = Sutton-upon-Derwent ; Sk. = Skipwith Common.

<i>Sphagnum compactum</i>	Sk.	<i>Polytrichum juniperinum</i> cfr.	A, M.
<i>S. cuspidatum</i>	A.	<i>P. formosum</i>	A, M.
<i>S. molluscum</i> cfr.	Sk.	<i>P. commune</i>	A, M.
<i>S. subsecundum</i>	A.	<i>Pleuridium subulatum</i>	M.
<i>S. inundatum</i>	A, M.	<i>Ceratodon purpureus</i>	general.
<i>S. rufescens</i>	A, M.	<i>Dicranella heteromalla</i>	general.
<i>S. cymbifolium</i>	A, M.	<i>D. cerviculata</i>	A, M.
<i>Catharinea undulata</i>	general.	<i>Campylopus pyriformis</i> cfr.	A.
<i>Polytrichum piliferum</i>	A.	<i>Dicranum undulatum</i>	Sk.

* This plant has since been found to be well established in this habitat, and as it appears to be new to the county, fuller details have been communicated to the Recorder for the E.R., Mr. R. J. Flintoff.—F.A.M.

<i>Dicranum spurium</i>	Sk.	<i>Brachythecium albicans</i>	M.
<i>D. scoparium</i>	general.	<i>B. purum</i>	M.
<i>Leucobryum glaucum</i>	Sk.	<i>Eurhynchium piliferum</i>	M.
<i>Fissidens bryoides</i> cfr.	S.	<i>E. praelongum</i>	general.
<i>F. viridifolius</i> cfr.	S.	<i>E. striatum</i>	M.
<i>F. taxifolius</i>	S.	<i>Plagiothecium denticulatum</i>	
<i>Grimmia apocarpa</i>	M.		general.
<i>G. pulvinata</i>	M.	<i>Amblystegium serpens</i>	general.
<i>Tortula muralis</i>	general.	<i>A. filicinum</i>	M.
<i>Barbula fallax</i>	M.	<i>Hypnum riparium</i>	M.
<i>B. hornschuchiana</i>	M.	<i>H. aduncum</i>	
<i>B. convoluta</i>	general.	var. <i>aquaticum</i>	A.
<i>B. unguiculata</i>	general.	<i>H. fluitans</i>	
<i>Cinclidotus fontinaloides</i> in Canal at Sutton.		var. <i>falcatum</i>	A.
<i>Orthotrichum diaphanum</i>	M.	<i>H. cupressiforme</i>	
<i>Physcomitrium pyriforme</i>	A.	var. <i>ericetorum</i>	A, M.
<i>Funaria hygrometrica</i>	general.	var. <i>tectorum</i>	A, M.
<i>Aulacomnium palustre</i>	A.	<i>H. cordifolium</i>	M.
<i>A. androgynum</i>	Sk.	<i>H. schreberi</i>	A, M.
<i>Webera nutans</i>	general.	<i>Hylocomium squarrosum</i>	general.
<i>W. annotina</i> var. <i>erecta</i>	Sk.	<i>Aneura pinguis</i>	M.
<i>W. carnea</i>	S.	<i>Aplozia crenulata</i>	
<i>Bryum pendulum</i> cfr. on wood piles in canal	M.	var. <i>gracillima</i>	Sk.
<i>B. capillare</i>	general.	<i>Gymnocolea inflata</i>	A, Sk.
<i>B. erythrocarpum</i> cfr.	M.	<i>Cephalozia bicuspidata</i>	A, M, Sk.
<i>B. argenteum</i>	S.	<i>Lophocolea bidentata</i>	general.
<i>Mnium affine</i> var. <i>elatum</i>	Sk.	<i>L. heterophylla</i>	general.
<i>M. undulatum</i>	A, M, S.	<i>Chiloscyphus polyanthus</i>	A, S.
<i>M. hornum</i>	general.	<i>Calypogeia trichomanis</i>	general.
<i>Thuidium tamariscinum</i>	general.	<i>C. arguta</i>	A, M, S.
<i>Brachythecium rutabulum</i>	general.	<i>Lepidozia trichoclados</i>	Sk.
		<i>Ptilidium ciliare</i>	Sk.

LICHENS (W. E. L. Wattam) :—Observations during the two miles walk along the York to Hull highway, on leaving the bus at Barmby, although habitats were not very varied, resulted in the following species being noted.

Peltigera canina Willd. On humus, hedgerow base.

Evernia prunastri Ach. Ash boles.

Xanthoria parietina Th. Fr. Barn tiles.

Placodium aurantiacum Hepp. Ash boles.

Pl. ferrugineum var. *festivum* A. L. Sm. Silicious stones of a garden wall.

Candelariella vitellina. Müll-Arg. Silicious stones, Ash and Oak boles, and old palings.

Physcia hispida Tuckerm. Silicious stones.

Lecanora muralis Schær. Silicious stones.

L. varia Ach. Old palings.

On passing through Allerthorpe the under-mentioned species were found, chiefly on the brick wall of the churchyard :—

Xanthoria parietina Th. Fr.

Placodium citrinum Hepp.

Candelariella vitellina Müll-Arg.

Lecanora campestris B. des Lesd.

L. atra Ach.

L. muralis Schær.

Considerable time was spent on the Common to its boundary with the Sutton Road. It was soon evidenced that, in general, the dry sandy nature of the soil was against a luxuriant lichen growth. In parts the peat layer seldom exceeds one to three inches in thickness, and it is only

in the depressions where dwarfed mosses have made a better covering of humus, and under Ling, that the species of *Cladonia* excel. Typical species, as *Cladina sylvatica*, *Cetraria aculeata*, and *Stereocaulons* were missing. Considerable portions of the Common are covered with a dense growth of *Deschampsia*, *Agrostis* and *Molinia*, and on the old decayed basal turf of these grasses *Cladonias* denizen, along with *Lecidia granulosa* and *L. uliginosa*. Towards the north-western end of the Common trees are abundant: Scots Pine, Birch, and Willows dominating, with occasional Oak, Ash and Beech, and there are a few palings. The lichen growth on these likely habitats was disappointing, even the species which did occur being, with few exceptions, scanty. There are no rock outcrops, boulders or pebbles, hence the reason of lack of saxicolous species

The following species were noted on the Common:—

Parmelia physodes Ach. On boles of Scots Pine and Ling.

P. saxatilis Ach. Few scraps on Oak boles and palings.

P. conspersa Ach. On palings.

Physcia pulverulenta Nyl. Protruding roots of Scots Pine.

Placodium citrinum Hepp. On mosses and decayed branches of Goat Willow.

Candelariella vitellina Müll.-Arg. Old palings.

Lecanora pallida Schär. Bark of Goat Willow.

L. varia Ach. Old palings and Ling stems.

L. conizae Nyl. Boles of Scots Pine, Birch and old palings.

L. symmictera Nyl and var. *aitmea*. Tree stumps and old palings.

Lecidia granulosa Schär. On peat and turfy soil, with the var. *B. escharoides*.

L. fuliginosa Ach. On peat and turfy soil.

Cladina uncialis Web. On peat.

Cladonia pyxidata Hoffm. and var. *pocillum*. On sandy peat.

C. fimbriata Fr. On dwarfed mosses sandy peat.

C. cervicornis Schär. On sandy peat.

C. gracilis Willd. On sandy peat, and with the var. *chordalis* amongst Ling.

C. coccifera Willd. Abundant on peat.

C. flœrkeana Fr. On peat.

FUNGI (F. A. Mason):—The Agarics seen on this Excursion were mostly common species, but the associations of some of them were very interesting. In woods of Birch and Pine, on the edge of the Common, *Lactarius rufus* was easily the commonest species, and some very complete rings of this fungus were observed. Along with it were *Paxillus involutus* and *Boletus scaber*. Two specimens of *Boletus bovinus* were seen, one of which was collected by Miss R. Kilby.

Amanita rubescens was plentiful, and with it occurred *A. muscaria* and *Amanitopsis fulva*, *Russula cyanoxantha*, *R. ochracea*, *R. furcata*, and *R. virescens*. Polypores were few; *Polystictus perennis* on the ground, under Pines, was noted, *P. versicolor* was common. *Polyporus betulinus* has made the usual havoc with the Birch, although the tree, in such favourable surroundings, is still able to hold its own.

The fairy-ring champignon, *Marasmius oreades*, was abundant on the Common, and about a pound of this useful species was collected for edible purposes.

Several specimens of *Hebeloma longicaudum* were collected, and three examples from different localities were each attacked by the beetle *Oxyporus rufus*.

Parasitic fungi were abundant. Very serious attacks on Oak, in all stages of growth, particularly when about 4 to 6 ft. high, by *Monilia alphitooides* Griff. et Maub., were noted, and many shrubs were white entirely from the lowest leaves to the topmost shoot with the conidia of this species.

The following species of rust fungi were collected by various members of the Galls Committee and myself :—

- Uromyces trifolii* Lév. On living leaves of *Trifolium pratense*.
- U. repens* Lagerh. On living leaves of *T. repens*.
- U. ficariae* Lév. On living leaves of *Ranunculus ficaria*.
- U. polygoni* Fuckel. On living leaves of *P. aviculare*.
- U. acetosae* Schröt. On living leaves of *Rumex acetosella*.
- U. dactylidis* Otth. Æcidia on living leaves of *Ranunculus repens*.
- Puccinia glomerata* Grev. On living leaves of *Senecio jacobæa*.
- P. centaureæ* D.C. On living leaves of *Centaurea nigra*.
- P. obtegens* Tul. On living leaves of *Cirsium arvense*.
- P. variabilis* Grev. On living leaves of *Taraxacum officinale*.
- P. malvaearum* Mont. On living leaves of *Malva sylvestris*.
- P. caricis* Reb. Æcidia on *Urtica dioica*. Teleutospores on *Carex acutiformis*.
- P. coronata* Corda. Uredospores on *Holcus mollis*.
- Coleosporium senecionis* Fr. Teleutospores on *Senecio jacobæa*.

Several mildews were seen and two or three were collected which have not yet been identified. All of them occurred on living plants as annotated. Three Phycomycetes occurred as follows :—

- Plasmopara densa* Schröt. On *Bartsia odontites*.
- Peronospora arenariae* De By. On *Arenaria serpyllifolia*.
- P. trifoliorum* De By. On *T. repens*.

The Erysiphaceæ were represented by :—

- Podosphaera leucotricha* Salmon. On *Cratægus oxyacantha*.
- Sphaerotheca pannosa* Lév. On *Rosa arvensis*.
- Uncinula salicis* Winter. On *Salix capræa*.

VERTEBRATE ZOOLOGY (C. F. Procter) :—For obvious reasons, Vertebrate Zoology, on an excursion of this character, is dependent more on evidence than on specimens for its records. An extreme paucity of bird life was the rule ; this seems to always occur where the protective instinct of man is not much felt, and is in no sense due to what is very commonly regarded as man's persecution. The only birds that were noticed were Nightjar, Curlews (apparently nesting), Rooks, Carrion Crows, and a few of the commoner Finches and Turdidae. The Cuckoo was heard from several directions frequently during the day. There was ample evidence of the presence, in numbers, of Owls and Hawks, although none was seen ; I heard a Corncrake in two different places. This is the first time this year that I have heard a Corncrake anywhere, although the Cuckoos have been more than usually numerous.

One Fox-earth was seen, and there was ample evidence that Foxes use the whole of the Common regularly. A Short-tailed Field-mouse was picked up, and all the common rodents would be plentiful. I observed a new exposure of the sand on the west side of the lane leading down to the Common from Barmby Moor, which had been excavated for building purposes on arable land, and it was interesting to find that below the building depth, the sub-soil was penetrated in all directions with the tunnels of small rodents, scarcely a square foot of the exposed surface being free from tunnels, none of which was made by rabbits.

The amphibia were represented by a single specimen of Smooth Newt, and the usual Frogs and Toads. Mr. Wattam reported to me that he had observed three Vipers, not far from one another, on a sunny bank. During the day, a sharp look-out was kept for grass snakes, or evidence of them in the way of cast skins, but none was forthcoming. Lizards were reported by two of us ; these would undoubtedly be common lizard, *Lacerta vivipara*, and the situation is ideal for these reptiles. Although evidences of the rabbit were everywhere, very few were seen. This is in sharp contrast with what happens in more remote areas, such as the limestone

districts, and is a very simple evidence of the response to the preservation instinct which very soon develops into a habit of life.

MOLLUSCA (Greevv Fysher):—Attention was mainly given to the head of the Pocklington Canal and the adjoining fields, and the following species were noticed:—*Limnæa peregra*, *L. palustris*, *Bythinia tentaculata*, *Valvata piscinalis*, *Planorbis umbilicatus*, *P. spirorbis*, *Sphaerium corneum*, *Succinea elegans*, *Physa fontinalis*, *Helix cantiana* (this species was also taken on Allerthorpe Common by Miss Pilkington), *Hygromia hispida*, *Vitrea cellaria*, *Arianta arbustorum*, *Helix nemoralis*, *Pyramidula rotundata*.

Smaller species of *Pisidium* were very abundant in the Canal Head, but as this genus presents special difficulty in identification, Mr. J. W. Taylor submitted them to Mr. Stelfox, who reports as follows:—*P. subtruncatum*, *P. nitidum*, *P. milium*, *P. casertanum*.

ENTOMOLOGY, GENERAL (T. Stainforth):—The Entomological Section was well represented, as will be seen by the reports appended. Special search was made by coleopterists for *Miscodera arctica*, four specimens of which were captured on the excursion, all under tufts of heather. One example of *Pterostichus lepidus* was also taken. Some dead Ash tree stumps on the footpath to Barmby were riddled by the larvæ of *Sinodendron cylindricum*, and hundreds of the beetle could have been secured. On a casual visit to the Pocklington Canal, a specimen of *Donacia sericea* was found.

Apparently no one paid special attention to the Lepidoptera. Search on Sallows resulted in the finding of the tiny black eggs of the Sallow Kitten Moth, which are laid singly on the under surface of the leaf, and the eggs of the Eyed Hawk Moth (commonly), the Puss Moth, and the Pebble Prominent. On the road side, near headquarters, eggs of the Oak Eggar were found on hawthorn; and in various parts of the Allerthorpe district, eggs of the Orange Tip Butterfly were noticed on cruciferous plants. The caterpillar of the Emperor Moth was not scarce, examples being found on low sallow plants, and on brambles. None was seen on heather. The caterpillars of the Goldtail Moth were abundant in the hedges, and colonies of larvæ of the small Tortoiseshell Butterfly were seen among nettles. The large Skipper Butterfly was in numbers on the west side of the Common in company with the Green Forester (*Ino statices*).

COLEOPTERA.—Mr. W. D. Hincks, supplies the following list:—

<i>Cicindela campestris</i> L.	<i>Sinodendron cylindricum</i> L.
<i>Pterostichus adstrictus</i> Esch.	<i>Malachius bipustulatus</i> L.
<i>Metabletus truncatellus</i> L.	<i>Malthodes marginatus</i> Latr.
<i>Bolitobius thoracicus</i> F.	<i>Cryptocephalus labiatus</i> L.
<i>Oxyporus rufus</i> L.	<i>Phyllodecta vulgarissima</i> L.
<i>Rhizobius litura</i> F.	<i>Phylloptreta nemorum</i> L.
<i>Byturus tomentosus</i> F.	<i>Strophosoma lateralis</i> Pk.
<i>Chilocoris bipustulatus</i> L.	<i>Liosoma deflexum</i> Panz.
<i>Onthophilus striatus</i> F.	<i>Grypidius equiseti</i> F.
<i>Glischrochilus olivieri</i> Bed.	<i>Dorytomus salicis</i> Walt.

DIPTERA (Chris. A. Cheetham).—Diptera were not very plentiful, if we except the troublesome *Hydrotæa irritans*, but early July is perhaps not a good date, and though the day turned out fine, the weather had been very unsettled previously.

A full list is given which will serve to show what may be expected in the district at this date.

One interesting feature is a group of species generally associated with the seashore.

Thereva bipunctata.
T. annulata.

Sciopus maritimus.
Pipunculus minimus.

Possibly their association is with sandy areas, and these are most frequently found by the seashore.

The Tachinids, *Metopia leucocephala* and *Sphecapata conica*, are parasitic on Hymenoptera which burrow in the sand.

<i>Cordyla nitidula</i> Edw.		<i>Sympycnus annulipes</i> Mg.
<i>Acnemia nitidicollis</i> Mg.		<i>Campsicnemus scambus</i> Fln.
<i>Polylepta guttiventris</i> Ztt. (<i>undulata</i> Winn.).		<i>Pipunculus zonatus</i> Ztt.
<i>Tetragoneura sylvatica</i> Curt.		<i>P. terminalis</i> Thoms.
<i>Macrocerca centralis</i> Mg.		<i>P. campestris</i> Ltr.
<i>Limnobia quadrinotata</i> Mg.		<i>P. semifumosus</i> Kow.
<i>Erioptera tænionota</i> Mg.		<i>P. minimus</i> Bkr.
<i>Limnophila fulvonervosa</i> Schum. (<i>lineolella</i> Verr.).		<i>Liogaster metallina</i> F.
<i>L. nemoralis</i> Mg.		<i>Chrysogaster splendens</i> Mg.
<i>Nephrotoma (Pachyrrhina) scurra</i> Mg.		<i>Chilosia scutellata</i> Fln.
<i>N.</i>	<i>guestfalica</i>	<i>C. illustrata</i> Harr.
	Westf.	<i>C. albitarsis</i> Mg.
<i>N.</i>	<i>quadrifaria</i>	<i>C. mutabilis</i> Fln.
	Mg.	<i>Leucozona lucorum</i> L.
<i>N.</i>	<i>lunulicornis</i>	<i>Syrphus ribesii</i> L.
	Schum.	<i>S. balteatus</i> Deg.
<i>Tipula fascipennis</i> Mg.		<i>Sphæophoria menthastris</i> L.
<i>Rhyphus fenestralis</i> Scop.		<i>Baccha elongata</i> F.
<i>Chloromyia formosa</i> Scop.		<i>Sphægina clunipes</i> Fln.
<i>Microchrysa polita</i> L.		<i>Volucella bombylans</i> L.
<i>Beris vallata</i> Först.		<i>V. pellucens</i> L.
<i>Lasiopogon cinctus</i> F.		<i>Ptychomyia selecta</i> Mg.
<i>Chrysopilus cristatus</i> F.		<i>Onesia cærulea</i> Mg. (<i>cognata</i> Mg.)
<i>Leptis scolopacea</i> L.		<i>Metopia leucocephala</i> Rossi.
<i>Thereva nobilitata</i> F.		<i>Sphecapata (Sphixapata) conica</i> Fln.
<i>T. bipunctata</i> Mg.		<i>Euphorbia cæsarion</i> Mg. (<i>cornicina</i> of our list).
<i>T. annulata</i> F.		<i>Stomoxys calcitrans</i> L.
<i>Hybos culiciformis</i> F.		<i>Phaonia pallida</i> F.
<i>Empis livida</i> L.		<i>Mydæa urbana</i> Mg.
<i>E. stercorea</i> L.		<i>M. (Spilogaster) duplicata</i> Mg.
<i>E. pennaria</i> Fln. (<i>vernalis</i> Mg. of list).		<i>Drymia hamata</i> Fln.
<i>Hilara interstincta</i> Fln.		<i>Hylemyia nigrimana</i> Mg.
<i>H. (Oreogenet) flaviipes</i> Mg.		<i>H. præpotens</i> Wied.
<i>Ardoptera irrorata</i> Fln.		<i>H. brassicæ</i> Bche. (<i>Phorbia floccosa</i> Mcq.).
<i>Tachista arrogans</i> L.		<i>H. fugax</i> Mg. (<i>P. pudica</i> Rnd.).
<i>Tachydromia lutea</i> Fln.		<i>Anthomyia sulciventris</i> Ztt.
<i>T. notata</i> Mg.		<i>Chortophila trichodactyla</i> Rnd.
<i>Chelipoda melanocephala</i> F.		<i>Fannia (Homalomyia) serena</i> Fln.
<i>Neurigona suturalis</i> F.		<i>Spilogona vana</i> Ztt.
<i>Sciopus maritimus</i> Lichtw. (previ- ously recorded as <i>Psilopus</i> <i>contristans</i> W.)		<i>Azelia aterrima</i> Mg.
<i>Dolichopus vitripennis</i> Verr.		<i>Cenosia tricolor</i> Ztt.
<i>D. agilis</i> Mg.		<i>C. rufipalpis</i> Mg. (<i>elegantula</i> Rnd.)
<i>D. plumipes</i> Scop.		<i>Pegomyia rufina</i> Fln.
<i>D. longicornis</i> Stann.		<i>Suilla (Helomyza) lævifrons</i> Lw.
<i>D. simplex</i> Mg.		<i>Ditænia (Sciomyza) cinarella</i> Fln.
<i>D. ungulatus</i> L.		<i>Psila rosæ</i> F.
<i>Gymnopternus cupreus</i> Fln.		<i>Micropeza corrigolata</i> L.
<i>Chrysotus pulchellus</i> Kow.		<i>Rivellia syngenesiæ</i> F.
<i>C. neglectus</i> W.		<i>Palloptera arcuata</i> Fln.
		<i>Balioptera combinata</i> L.
		<i>Geomysa obscurella</i> Fln.

(To be continued).

REVIEWS AND BOOK NOTICES.

A Bird Book for the Pocket, by **Edmund Sandars** (London : Humphrey Milford, Oxford University Press, xix.+246 pp., 7/6 net). This handy little volume is remarkable for its cheapness, seeing that it contains coloured illustrations of the more common of our small birds, with their eggs. Although the pages only measure 5 $\frac{3}{4}$ ins. by 4 ins., the author has been successful in some cases in getting as many as five illustrations on a page, though usually two is the average. Naturally they are not as good as the more expensive volumes, but at 7/6 is not at all dear.

London's Countryside, by **Edric Holmes** (London : Robert Scott, 344 pp., 7/6 net). This volume is due to the increased attention being paid to the countryside, possibly as a result of the facilities now existing for getting from one place to another. The author deals with the principal places in Cambridge, Oxfordshire, Kent, and the neighbourhood, and illustrates his very interesting chapters with little sketches likely to be of interest; ruins, bridges, churches, etc. The volume will be found exceedingly useful to anyone visiting this area and desiring information relating to it.

Insect Pests, by **E. T. Ellis** (London : G. Allen & Unwin, 156 pp., 3/6 net). Gardeners and those interested in forestry know full well the great amount of damage done by animal pests, especially insects. In the present volume the author deals with pests of the garden, the farm, the orchard, and the forest. In the first series he has chapters on Cabbage, Onion, Pea and Bean, Potato, Root Crops, Saladings, Miscellaneous Vegetable Pests ; and he deals with the various aphides, caterpillars, weevils, worms, maggots, flies, beetles and moths. Valuable information is also given as to the best means of combating these parasites.

Everyman's Sussex, by **Richard Gilbert**. London: Robert Scott, 128 pp., 3/6 net. In a series of 'word pictures,' Mr. Richard Gilbert describes the Sussex countryside in varying moods and seasons, and he has arranged his short articles under the heads of 'In the Woods'; 'By the Waterside'; 'On the Downs'; 'At Closer Quarters'; 'My County'; 'Impressions'; and 'Through the Year.' The work is illustrated by sketches of the Bridge, Beacon, Dewpond, Patcham Windmill, etc., though, according to Mr. Glass's book, reviewed elsewhere, the 'composition' of some of these sketches might be improved.

Days with the Golden Eagle, by **Seton Gordon** (London : Williams & Norgate, Ltd., xx.+176 pp., 12/6). The work of Mr. Seton Gordon among the larger birds of prey is so well known that it is not necessary to do more than inform our readers of still another book from his pen. In the present instance the volume deals entirely with the Golden Eagle, has a beautiful coloured plate as frontispiece, and reproductions of a large number of excellent photographs showing the bird under various conditions. On the cover of the book is a replica of a coin of Agrigentum (*circa* 410 B.C.) representing an eagle attacking a hare.

Malden, or Life in the Woods, by **Henry David Thoreau** (London : Chapman and Hall, xii.+289 pp., 25/- net). The author of this book was born over a century ago, and died at a comparatively early age. He published a number of volumes, the present one perhaps being the most important and best known. It deals with two years' experiences at Walden Pond in Massachusetts, and the work refers in detail to the fauna and flora of that interesting area. The present publication brings his fine work before the naturalist in a pleasant form, the type is good, and there are several remarkable illustrations from woodcuts by E. Fitch Daglish.

Science and Human Progress, by **Sir Oliver Lodge** (London : G. Allen & Unwin, 187 pp., 4/6 net). The Halley Stewart Trust, founded in 1924 for Research towards the Christian Ideal in all Social Life, is responsible for the production of the present volume, which, though only published two or three months ago, has already been reprinted. Sir Oliver prints a series of six lectures dealing with Knowledge

and Progress ; Design and Purpose ; Help and Guidance ; Faith and the Quest for Truth ; Life and its Mysteries ; Death and Hereafter. Whether we agree with everything in the volume or not, there is no doubt that Sir Oliver's writings always have a fascination.

Social Life in the Animal World, by Fr. Alverdes. London : Kegan Paul, Trench, Trubner & Co., ix.+216 pp., 10/6 net. Probably the object of this volume can best be explained by the publishers' announcement, which, in this case, seems particularly clear and concise :— ‘The author has collected and summarized all the information at present available regarding the social life of animals. He deals not only with herd life, with the relations between mated animals, and with the family, but also with the features that develop when a number of animals are (*sic*) grouped into an association as, for instance, the establishment of an order of precedence, means of communication, and mutual assistance. But his greatest achievement is his success in showing the vital importance of animal sociology for social psychology. He has abundantly proved that much we commonly regard as strictly human is equally characteristic of animal groups and societies, and that the solution of certain difficult problems of human sociology is to be sought and found in the animal kingdom.’

—:o:—

NEWS FROM THE MAGAZINES.

Mr. Philip B. Reckitt gives a very graphic account of a Bull Fight in Peru, describing the various incidents from beginning to end, in *Ours*, the magazine of Reckitts, for August.

The Museums Journal for September is largely occupied by the proceedings of the Conference of the Museums Association, held in the Isle of Man, and there is a reproduction of an old print of Tynwald Hill, the annual ceremony at which coincided with the Association's visit.

Professor J. L. Myres writes to *Nature* to the effect that he has received a cutting from the *Daily Mail* of Bombay, which gave two columns to a discussion of his views about the ancient Amazons, which he is represented as having given at a meeting of the British Association. Professor Myres says he has never discussed the question of the ancient Amazons anywhere.

In *Nature*, No. 3016, in an article on ‘Discovery of Stone Implements of Lower Palæolithic Age in Ireland,’ is figured a ‘prepared core’ in limestone found *in situ* in Boulder clay at a depth of 39 feet from the surface at Ballyconnell, Sligo. Judging from the illustration, which seems to be a good one, we must say we do not believe it is a ‘prepared core in limestone,’ but a perfectly natural product.

We learn from the *Journal of the British Science Guild* for July that in 1730 Dr. Stukeley wrote : ‘According to the calculations I have made, I find God Almighty ordered Noah to get the creation into the Ark on Sunday, the 12th October, the very day of the autumnal equinox of that year ; and on this present day, on the Sunday sennight following (the 19th of October), that terrible catastrophe began, the moon being past her third quarter.’ Moonshine has long been potent : in many senses.

We learn from *The Vasculum* for July that ‘the International Commission on Zoological Nomenclature wishes to know what zoologists think of a proposal for ‘the suppression of ‘a certain list ‘from nomenclatorial consideration. Examples of generic names used : Siemekiewiczianogammarus, Cancellloidokyterdermogammarus, Loveninskyterdermogammarus, Parapallaseakytydermogammarus.’ We think the ayes have it.’ The same journal has notes on ‘Coumarin,’ ‘Animal “Treks” in Northern Europe,’ ‘Abnormalities in the flowers of *Rosa mollis*,’ and local Lepidoptera and Bryophytes,

With its wealth of illustration familiar to its subscribers, *The Journal of Ecology* for August contains the following valuable memoirs:—‘Distribution of Vegetation on the Plains of European Russia,’ by Boris A. Keller; ‘The Bearing of Ecological Studies in New Zealand on Botanical Taxonomic Conceptions and Procedure,’ by L. Cockayne and H. H. Allan; ‘The Plant Communities of Table Mountain,’ by R. S. Adamson; ‘The Plant Colonisation of Merse Lands in the Estuary of the River Nith,’ by W. L. Moriss; ‘The Heath Association on Hindhead Common, 1910-1926,’ by F. E. Fritsch; and ‘The Results of an Unintentional Ecological Experiment,’ by V. S. Summerhayes and W. B. Turrill.

We have to go to *The Museums Journal* to learn that the Lord Mayor of Leeds presented a ‘handsome’ cheque, in a wallet, to Mr. Henry Crowther, who at seventy-nine is still doing good work; that the J. A. Butterfield collection of lesser British moths, ‘comprising between three and four thousand specimens,’ has been acquired by the Keighley Museum; that the Natural History Collection has been removed from the University College, Nottingham, to Wollaton Hall, where Professor J. W. Carr is now to be found; that a Craven Museum is to be established in connexion with the Skipton Free Library; and that over 3,000 geological specimens have been given to the ‘New Geological Museum, Wigan,’ by Mr. J. Spencer.

—: o :—

NORTHERN NEWS.

The death is announced of Sir Harry Johnston at the age of 69. He contributed much to our knowledge of the natural history of Africa.

Messrs. R. R. Gates and J. Latter have recently given observations on the pollen development of two species of *Lathraea* (*L. clandestina* and *L. squamaria*) to the Royal Microscopical Society.

In ‘Nos. 15 and 16’ of the British Association Excursions Handbook is an illustration of ‘Gaping Ghyll,’ and we learn that ‘to appreciate the scale observe the two men standing near the patch of light.’ We have tried, and used spectacles, but can’t find the two men.

The Memoirs of the Queensland Museum, issued April 28th, contain a paper on ‘Additions to the Cretaceous Ammonite Fauna of Eastern Australia,’ Part I. (*Simbirskitidae*, *Aconeckeratidae* and *Parahoplitidae*), by F. W. Whitehouse. This includes descriptions of *Simbirskites morvenae*, which belongs to the group of *S. speetonensis* Pavlow non Young and Bird, and *S. fasciato-falcatus* (Lahusen) for which possibly a new generic name is required.

A photograph and interview with Mr. W. T. Westall, who was seen ‘mowing his few square feet of lawn,’ appears in a recent evening Journal. Mr. W. T. Westall saw two hundred Tits that morning and heard seven pairs of nightingales singing round about his place this year. This was near Croydon. He informed the reporter that Beeches always catch the rain because their branches always point upwards. This must surely be some relation to our other naturalist, Mr. W. P. Westall!

Our contemporary, *Punch*, is taking an interest in natural history, and in a recent issue has an article headed, ‘Ornithology for the Seaside,’ in which various species of birds are described, including, oddly enough, The Curlew and The Auk. We are taking the liberty of giving two of the descriptions: The Gannet.—There isn’t a bird on the planet Who’s fonder of fun than the Gannet; So he’s rather an ass To reside on the Bass, And not on the Island of Thanet. The Puffin.—Well, what do you say if we rough in A lyrical sketch of the Puffin? His beak—but in verse One is bound to be terse, And perhaps we have now got enough in. In a subsequent issue *Punch* records that ‘It is said that the female crab has 1,000,000 young at a birth. No wonder the father crab’s eyes stick out so far! ’

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A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
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NOTES AND COMMENTS.

BRITISH ASSOCIATION : FURTHER ABSTRACTS OF PAPERS.

SURVEYS AND MAPS OF THE ELIZABETHAN PERIOD REMAINING
IN MANUSCRIPT—SAXTON, SYMONSON AND NORDEN,

BY SIR GEORGE FORDHAM.

This paper is an attempt to gather up the work, other than that which has been perpetuated by the engraver's art, of three representative surveyors and cartographers who flourished during the last quarter of the sixteenth and the first of the seventeenth centuries—Christopher Saxton, Philip Symonson, and John Norden. Saxton's activity in private practice as a surveyor seems to have been confined to a period of ten years, 1596–1606; his atlas of the counties of England and Wales having been completed in 1579, and his large scale map of England and Wales having been published about 1580. He surveyed Manchester in 1596, but this map cannot now be found. In the same year Saxton was a witness in proceedings as to boundaries in Lincolnshire, and in 1599 he was similarly engaged, as he was also in 1601 and 1606 in controversies as to water-rights, in all of which proceedings he prepared and certified plans. These plans are now in the Public Record Office. A plan of Dewsbury and of the River Calder above that town, by Saxton, is in the Dewsbury Free Library, and dated 1600. Symonson is only known generally by his important map of Kent of 1596. He was superintendent and surveyor of the Rochester Bridge Estates from 1592 until his death in 1598.

ESTATE SURVEY.

During his term of office he surveyed and mapped four of the estates, the property of the Bridge Wardens, and three of these maps still exist among the archives of this corporation. In art, appearance and colouring, they resemble closely the work of Saxton. Norden's work in estate survey is much more instructive from the point of view of the history of cartography in England than that of either of his contemporaries. In 1600–1601 he made an elaborate survey, drawn in twenty-eight large sheets, of the estates of Sir Michael Stanhope in and around Orford, on the coast of Suffolk. These maps are now in two sections, following a division of the original estate, of which one (maps I. to X.) is in Woodbridge, in the office of Mr. Ernest Wood, solicitor, and the other (maps XI. to XXVIII.—except XIII., which is missing) is in the Subdourne Estate Office, at Chillesford Lodge, near Orford. This series is of uniform appearance and detail, and is drawn in bright colours on vellum sheets measuring about 528 mm. in height by 722 mm. in width. It is a work of considerable cartographical importance, and

geographically is interesting for the delineation of a long length of coast line, since 1600 subject to alteration and erosion. The total acreage mapped is about 15,000.

NORDEN'S WORK.

Norden's next important work was a survey of the Honor of Windsor, with the Castle and all the forests, walks, parks, etc., and details of the head of deer in each. This is of 1601 and is on seventeen sheets of vellum, drawn in colours and gilded. Two copies are known, that made for the king (James I.) is in the British Museum (Harleian MS.), and a duplicate made for Henry, Prince of Wales, has been lately acquired by the Royal Library at Windsor Castle. A further important work was confided to Norden at this period, that of a complete survey of the manors and property of the Duchy of Cornwall in the West of England, made in the years 1609 to 1616. This also is now at Windsor, having been recently presented to the King by Lord Verulam from the Gorhambury Library. It has, however, but a few sketch maps, and is generally the written record of inquiries relating to the estates, and summaries of the particulars thus obtained, made up into two quarto volumes. It is obviously only of collateral interest in connection with the present subject. The paper deals fully with the maps and plans enumerated above, which are, especially those of Norden, instructive as illustrating the progress achieved in the reign of Elizabeth in the art and practice of survey and map construction. Few such maps, whatever may have been their original number, have survived to the present time, and those here described can certainly be regarded as typical of their period. It is possible, and it is hoped, that the publication of this study may lead to the discovery of other similar estate plans of early date now buried in public and private depositories.

RURAL SETTLEMENTS IN THE MIDDLE TRENT VALLEY, BY R. P. BRADY.

The relation of the area to the Midlands—its 'confluence' feature. The surface geology and its relation to relief and the main rivers. The distribution and types of village in relation to these. The riverside type—the gravel terrace type—the hillside type—the valley type of the lower Trias. Examination of the types by characteristic examples. Their sites analysed and their typical developments noted. The riverside villages from Willington to Swarkestone; the gravel villages of Weston and Aston; the spur villages of Mickleover and Littleover; the townships of Repton and Donnington. Some changes in value of the sites due to changing lines of communication.

THE COALMINERS OF THE EIGHTEENTH CENTURY, BY T. S.
ASHTON.

In Scotland, until 1775, the colliers were bound in lifelong servitude ; and, before and after emancipation, the family was the labour unit. In the North of England a yearly hiring was general, under bonds made between individual colliers and their employers. South of the Tees the hiring period was much shorter, and the economic unit was a co-operative group of workers represented in bargaining by a leader or charter-master. Between 1700 and 1780 money wages remained constant, and food prices varied widely with the harvests, and in the industrial disturbances, which commonly occurred in years of shortage, animosity was directed, not against the employers, but against the dealers in grain. After 1780 wages showed more flexibility, and industrial disputes of the modern type took the place of food riots. Some migration of labour occurred between the coalfields, but there was little recruiting from other industries, and wages were maintained at a relatively high level. In spite of physical and spiritual isolation the mining population occasionally threw up men of talent. After 1815 an influx of outside labour was perhaps responsible for some fall of economic standards ; and too rapid development may explain some of the conditions revealed in the reports of the 'forties.

ROMAN SIGNAL STATIONS ON THE YORKSHIRE COAST, BY R. G.
COLLINGWOOD.

A considerable number of small Roman forts exist on the Yorkshire coast, all situated on high commanding ground such as Scarborough Castle Hill, Filey Brigg, etc., and each consisting of a stone rampart and ditch enclosing a strong central foundation evidently intended to support a tower. These fortified towers, several of which have been dug in the last 15 or 20 years, are signal-stations of a type evolved by a continuous process from a light wooden signalling-turret used in the early Imperial age ; as time went on, the system of signalling developed and the signal-stations became more massive and partook more of the character of miniature forts. These Yorkshire specimens are of unusual interest as evidence of the measures taken in the late fourth century A.D. to secure Britain against the piratical raids of Saxons and other tribes. They belong to the latest phase in the Roman occupation of Britain, and there seem to be references to them in the literature of the period. Five stations have been discovered, reaching from Scarborough to Saltburn ; it is highly probable that there were many others, some awaiting discovery, some doubtless destroyed by coastal erosion. In at least one case

—Scarborough—the Roman site is curiously complicated by prehistoric remains below it and mediæval above.

ROMAN YORK : THE EXCAVATIONS OF 1925-26, BY S. N. MILLER.

Most of the excavation has been done within the east corner of the fortress near Monk Bar. There has been a little supplementary digging in the Museum Gardens, by permission of the Yorkshire Philosophical Society. The total area so far excavated is small, and the conclusions it indicates are therefore to be regarded as provisional. Remains have been discovered of the clay rampart and wooden barracks of the original legionary fortress, which seems to have been established c. 71-74, in the governorship of Petilius Cerialis. The clay rampart was later replaced by a stone wall with an earth backing, probably c. 104-108, in Trajan's reign, and the first stone tower at the east corner would seem to date to that period. There is evidence to suggest that the tower and wall had to be repaired early in Hadrian's reign as the result of a destruction which may have had some connection with the disappearance of the Ninth legion and its replacement by the Sixth. This, however, requires confirmation, and here valuable evidence may be given by the series of interval towers, the sites of which can now be laid down round the circuit of the defences as the result of the fortunate discovery of a well-preserved example between the east corner of the fortress and Monk Bar. Whether or not the fortress suffered a disaster towards the end of Trajan's reign, it now seems certain that extensive damage was done in the serious trouble which broke out early in the reign of Commodus and led to the abandonment of Scotland (c. 182). During the lengthy period of restoration that followed the damage done at York was repaired, and the wall and east corner tower as then reconstructed can now be seen near Monk Bar still standing to a height of 15 feet.

THE MULTANGULAR TOWER.

The supplementary excavations in the Museum Gardens, besides helping to clear up the interior plan of the Multangular Tower, have proved that that bastion and the adjacent length of wall form one homogeneous structure, dating to the opening years of the fourth century, when Constantius was in Britain. How far this late reconstruction extended backwards from the river front is still to determine. So far there is no proof of any fourth-century occupation within the east corner, and it is just possible that the fortress may have been reduced in size. It is hoped that further excavation will enable the fourth-century defences to be traced, and throw light upon York and kindred fortresses as they existed under the military system represented by the *Notitia Dignitatum*.

THE ROMAN CAMPS AT CAWTHORN, BY I. A. RICHMOND.

These excavations, reported to the Association at Southampton in 1925, have since been continued for two months, in 1926. The results were the complete recovery of the plans of the wooden gates of Camp A, and the discovery of traces of a wooden front to the rampart of a type not discovered in Roman Britain before, but represented in various forms in the Rhine-lands. Unfinished earth-ovens of this period were also found, in almost every stage of construction, indicating the short life of such structures and the ease with which they could be excavated in firm subsoil. To the second period of occupation of this camp belong newly discovered rectangular pits covered with wigwam-like roofs, of which the strut-holes were found; these were apparently used for habitation, since they had hearths at their edges. A long narrow and deep pit which occurred near them was of quite different type and seems to have been a latrine-trench, but more examples are wanted. Excavations in Fort D, confined to its northern defences, produced evidence that these defences were never completely dug or finished, thus confirming surface indications on other parts of the circuit. Much still remains to be done at this interesting site, which continues to fulfil its early promise by producing unique features in an excellent state of preservation.

CUP AND RING MARKINGS, BY H. J. DUKINFIELD ASTLEY.

The real origin and significance of these mysterious markings are to be found in the endeavour of primitive man to express by signs, the meaning of which was understood by him and his fellows, the ideas which he would convey to them. It is suggested, therefore, that in these signs or markings we have at once both a primitive form of heraldry and the beginnings of an alphabet; as a primitive form of heraldry they are connected with Totemism. Various theories have been advanced as to the magical or religious significance of the markings; other theories are that they were astronomical, or intended to be maps of the locality in which they were found, and the like. A study of the examples which are to be seen, of instance, at Ilkley will be sufficient to show the baselessness of these theories.

THE PLACE OF MAN (*HOMO SAPIENS*) IN THE TERTIARY PERIOD,
BY SIR WILLIAM BOYD DAWKINS, F.R.S.

The study of mankind, formerly confined to history, has now been extended through prehistory far back into the geological record, in which Man (*Homo sapiens*) is the last outcome of the mammalian evolution which characterises the successive stages of the Tertiary Period. In this evolution

the Anthropids—universally taken to be intermediates between man and the higher apes—appear in the Late Pliocene or the Early Pleistocene, and apparently become extinct in Europe before the close of the Pleistocene Age. In Europe and in Palestine they occur in association with rude stone implements of the Chellean, Acheulean and Mousterian groups of the French archæologists, a fact which raises the question as to whether the whole of the Early Palæolithic implements, generally assigned to man, should be referred to one or other of the anthropoids. All the reputed cases of their association with *Homo sapiens* which I have examined turn out to be burials in later times. I should, therefore, answer that question in the affirmative. The anthropoids passed into Europe from their centres of evolution in the warmer regions of Africa and Asia along with the animals now living in warm climates, such as the hippopotamus. They ranged as far north as Yorkshire, occupying the same hunting grounds in middle and northern Europe as their successors the artists of the caves.

ARTIST CAVE-DWELLERS.

The artist cave-dweller—the earliest representative of *Homo sapiens* in Europe—has left his remains in strata that overlie those containing the implements of the anthropid hunters, and are, therefore, of later date and proved by the associative remains to belong to the last phase of the Pleistocene. He appears in Europe as an emigrant from Asia—a well-equipped hunter highly developed in brain and body and of the same physique as the Iberic or Mediterranean tribes that form the basis of the present population of Europe. He found his way into Britain when it was part of the Continent and lost his characteristic arts and crafts during the vast period of the slow depression of the Atlantic border, which created the British Isles and forms the hard-and-fast line between the Pleistocene and Holocene periods. He probably was absorbed in the invading Neolithic tribes that also came in from Asia, bringing with them the domestic animals and the Neolithic culture at the beginning of the Holocene age. Of the Holocene it only remains to note that prehistory shades into history, so that what is prehistoric in one region is historic in another. The records of Chaldea and Egypt, going back to about 4000 B.C., are the limits to the possibility of fixing a date in years. While, therefore, we cannot date the arrival of man in Europe, we can be sure of his vast antiquity, and trace him back to the last phase of the period when the British Isles were the uplands of the Pleistocene Continent.

PRIMITIVE WEAVING AT BANKFIELD MUSEUM, BY G. K. CARLINE.

Primitive weaving implements and the early history of weaving is essentially a suitable subject to illustrate in a

museum like Bankfield Museum at Halifax, as that town is in the centre of the weaving trade. It was on this account that the late H. Ling Roth, one of the chief authorities on primitive weaving, decided to exhibit this subject at Bankfield Museum as fully as he could. The collection starts with the usually accepted theory that weaving is probably derived from mat-making and basketry. The chief feature in weaving is the loom, and the evolution of the loom and the distribution of the various types as well as the evolution and distribution of the numerous accessories is the main purpose of the collection. At present the looms have been divided into those for mat-work, or in other words for unspun filament, and those in which a spun filament is used. Looms again can be divided into vertical, semi-vertical, and horizontal, but probably more important than the position is the method of obtaining the 'shed.' The most primitive way is to obtain it by hand, but a great advance was made when the use of a rod was introduced to which the alternate warp threads were attached. This is the rod-heddle. The frame-heddle, which is usually worked by the feet, enabled further advances to be made in devices to accelerate the speed of working.

THE OVERLAP OF THE BRONZE AND IRON AGES, BY R. C. C. CLAY.

Recent excavation has shown that cinerary urns of the collared type were the immediate predecessors of those of the barrel-bucket-globular types. It is unquestionable that the latter were the products of invaders. The close similarity in form and decoration between the barrel-bucket-globular types of cinerary urns and the domestic vessels of the first part of the early Iron Age, also the products of invaders, suggests that the two were contemporary—one the funereal and the other the domestic ware of the same peoples. It is probable that in the south of Britain the middle Bronze Age lasted up to the introduction of the knowledge of Iron.

AN ETHNOLOGICAL SURVEY OF SHEFFIELD AND THE SURROUNDING DISTRICT, BY MISS M. MCINNES.

A few years ago, in making an economic survey of Sheffield and the district around, a cursory glance at the workers seemed to offer material for an ethnological study. This was undertaken with interesting results. Investigations on hair and eye colour of 2200 school children in the outlying districts of South-west Yorks. and North-east Derbyshire, and of 6300 children in Sheffield itself, were recorded in the manner recommended by Beddoe. The methods for obtaining the Index of Nigrescence advocated by Parsons were preferably followed. The conclusions drawn were:—(1) That the Nordic types predominated throughout the area. (2) That the darkest children were found in the poorest and

most congested industrial areas of the city. (3) That the farther away from the city the fairer the children became, both of hair and of eye. (4) That 'nests' of dark children remained here and there in the outlying districts, especially on the higher gritstone moorlands of the Don Valley headstreams. (5) That mixed types, also, were found most often in the crowded city areas, though they occurred throughout the city in greater numbers than in the outlying districts. Investigations on adults confirmed these conclusions, and, in the variations found, gave interesting points for future study. Head and body measurements on adult town workers showed two types. The lighter cutlery and silver-plating trades employed, on the whole, a fairer, taller type than the heavy iron and steel works. The workers in the latter were stunted, longer of body, shorter of leg and darker of colour than those in the former. Both fell far below the average of the more leisured classes, where the tall, muscular, well-proportioned Nordic type was in the majority.

THE ALGÆ OF A BOG : FIVE YEARS' OBSERVATIONS.
BY A. MALINS SMITH.

The algæ of a small sphagnum bog have been examined, approximately monthly, for five years. Records of temperature and hydrogen-ion concentration of the water, as well as observations of the weather conditions and of the flow of the water, periodically have been taken. Chemical analyses of the water have also been made. The results shed light upon the specific composition of the alga-flora of such waters, the relative abundance and interdependence of the chief groups of algæ, and the periodicity of the various species. The relation of the alga-flora to the phanerogamic flora is briefly considered, and the status of the upland sphagnum bog as a habitat for a definite algal association is estimated. Comparison is made with the alga-flora of lowland pools and montane lakes.*

BRITISH FOREST POLICY. BY R. L. ROBINSON.

The paper is divided into three parts :—(1) *Pre-war Policy*, indicating briefly the efforts made by the State to safeguard the supply of shipbuilding timber—for example, after the Civil Wars and the Napoleonic Wars; the period of neglect following on the decline of wooden ships and the free access to abundant supplies of overseas timber to meet the needs of the great industrial expansion; the revival of interest during the twenty years or so preceding the Great War. (2) *Current Policy*.—The experience of the Great War; the Acland Committee's programme; the Forestry Act, 1919;

* But the author forgets to tell us where the bog is!—ED.

the Forestry Commission : its constitution, procedure and results achieved ; the probable position at the expiration of the Commission's tenth year of existence. (3) *Future Policy*. —Factors bearing on its determination ; the state of British woodlands as disclosed by Census of Woodlands ; probable demands for timber ; prospective supplies ; productivity of and extent of land available for afforestation ; forestry and land settlement ; responsibility of the State ; bases of action, finance and administration.

THE BISHOP'S DILEMMA.

We learn from the press that before leaving Leeds at the conclusion of the meetings of the British Association a distinguished professor penned the following lines as the last word in the controversy raised by the suggestion of Dr. Burroughs, Bishop of Ripon, that science should be given a rest for 10 years :—

(*To the tune of ' Tit Willow.'*)

From the land of the lotus a prelate propounds
A dilemma, dilemma, dilemma,
Where the chime of the minster for ever resounds
Pip-emma, pip-emma, pip-emma ;
For the bishop replies to the poet (who sings
That he's sure we should all be as happy as kings),
That the world is so full of a number of things !
Pip-emma, pip-emma, pip-emma.

The advancement of science is all very well
(Pip-emma, pip-emma, pip-emma),
But whither its going no fellow can tell :
A dilemma, dilemma, dilemma !
Discoveries puzzle episcopal heads ;
Ten years we shall need to unravel the threads ;
So close up the labs. and return to our beds
This pip-emma, pip-emma, pip-emma.

But though this for sundry persuasions and creeds
Is dilemma, dilemma, dilemma,
There's a moral, I think, for the people of Leeds,
This pip-emma, pip-emma, pip-emma.
It's all very well at the bishop to laugh,
But what science requires is a general staff
To garner the wheat and to winnow the chaff,
O scoffers with coffers—what offers ?—J.L.M.

THE GOVERNMENT AND MUSEUMS.

In an article in *The Connoisseur* for October entitled 'What about the Royal Commission,' by the Editor, Mr. C. Reginald Grundy, one or two instances are given to illustrate the necessity of keeping museum specimens, even although they may not be quite to the liking of the Director for the time being. Mr. Grundy deplores the comparatively small amounts given to public museums and galleries. He points out that 'The annual charge is less than the cost of a second-

class cruiser, and equivalent only to about the sum paid for producing those Government returns and other documents which provide so large a portion of the stock-in-trade of waste-paper merchants. But museums always show a tendency to expand. With increased size there is generally increased expenditure. The Government is anxious to check this expansion. To afford an awful warning of what may ensue, if the present practice of accepting desirable acquisitions remains unchecked, it requires the Commission to estimate what the expenditure on National Museums may amount to fifty years hence. Moreover, the Government puts forward a number of suggestions for checking the expansion of these institutions. It asks if the less desirable of their contents may not be lent, given away, or sold, and the remainder redistributed among the museums so as to effect an economy of space.'

CHANGES OF FASHION.

He truly says: 'Fashions in art are always changing, and the rejected of one generation may become the treasures of another. It is on record that Thomas, first Lord Ribblesdale, gave James Ward's picture of Gordale Scar to the British Museum. After the picture had been retained some years, it was bundled back to him, and his great-grandson had the pleasure of selling it to the National Gallery authorities in 1878 for £1,500. Another analogous case is that of some of the valuable Italian pictures in the Louvre. These were taken from Italy, with numerous other art treasures, by the first Napoleon. By the treaty of 1815 the French were required to give them up, but they were never claimed, because the Italian authorities at the time did not consider them worth the trouble of collecting. As a rule, all the specimens in our national museums are good of their kind, and while such discrepancies in the tastes of successive generations occur, it will never be safe permanently to dispose of any because their type happens to be unpopular at the moment.'

ADMISSION FEES TO MUSEUMS.

'The enforcement of a more general system of admission fees to museums would probably result in increased revenue, but not sufficient materially to relieve the nation of the cost of upkeep. Should an entrance fee of sixpence be enforced every day at every museum, and the visitors still maintain their present numbers, the proceeds would not amount to much more than a twentieth of the annual expenditure on these institutions. But the visitors would not maintain their numbers. It is noteworthy that places like the National Gallery and the National Portrait Gallery, where admission fees are levied on certain days in the week, do not command anything like the large attendances as other institutions

entirely free to the public. The possibility of blundering in on a non-free day and having to pay acts as a deterrent to the latter, and so they prefer to visit other often less attractive institutions where no such risk is incurred.'

MUSEUMS AND EDUCATION.

The museums must not be regarded merely as exhibitions brought together for the entertainment of idle and leisured sightseers. They form, in fact, both the foundation and coping stones of our national system of higher education. In them the working classes and children can acquire their first conceptions of the more exalted results of art and science ; while the advanced student can perfect his expert knowledge by studying the best examples of fine and applied art and invention, and the recondite marvels of nature. These classes have generally few sixpences to spare, and to hinder their visits would be largely to nullify the functions which the museums are intended to perform.' In this way Mr. Grundy confirms our contention that if, as should be the case, a museum is an educational institution, every possible assistance should be given for the collections to be visited by all classes. To make a charge for admission is therefore undesirable, and certainly likely to retard a museum's useful work.

GLACIERS THROUGH A MICROSCOPE.*

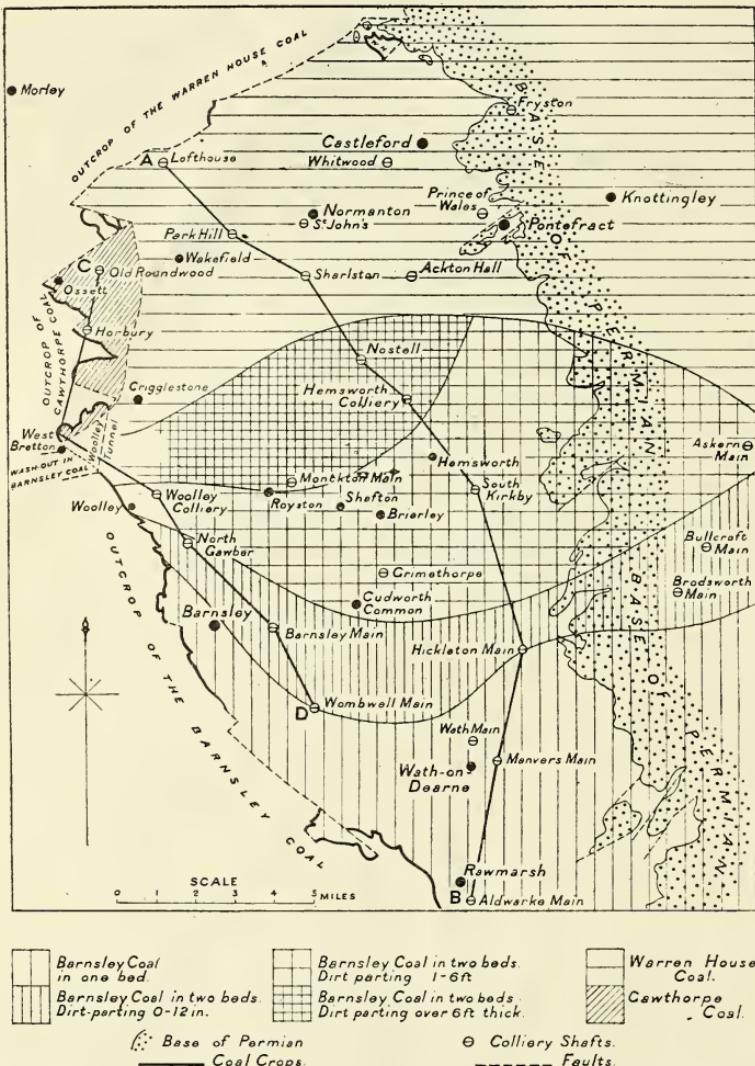
In the early days of geology, when different theories of mountain building had different supporters, some considered that it was not safe to try to find the origin of a mountain by the aid of a microscope. In the present memoir, Dr. Tutton certainly seems to have studied glaciers and ice fields by the aid of a microscope, and a large section of his valuable work deals with the chemistry of water and ice, crystal structure, optics, artificial ice, and so on. Following these are well-illustrated chapters dealing with the Alps, Glacier Movement, Glaciers, Crevasses, Moraines, etc. Later, the various alpine areas and other glaciers are described in detail, aided by a wonderful series of reproductions from photographs, there being nearly 200 of these in the volume, and all good ones.

BARNSLEY COAL AND ITS VARIATIONS

In *The Summary of Progress of the Geological Survey* for 1926, recently issued, Mr. D. A. Wray has a paper on the above subject, which is quoted in *The Colliery Guardian* for September 9th, to which journal we are indebted for the loan of the block used herewith. The Barnsley, or Top Hard Coal, is one of the most important and valuable seams of coal in the York, Derby and Nottingham coalfield. The seam mainly owes its high economic value to the presence of a

* 'The Natural History of Ice and Snow,' by A. E. H. Tutton. London : Kegan Paul, Trench, Trubner & Co., Ltd., xvi.+319 pp., 21/- net.

band of hard, semi-anthracite coal, commercially termed 'Hards,' which characterises the seam wherever it is typically developed. This layer, varying from two to three feet in thickness, consists of dull anthracite bands alternating with

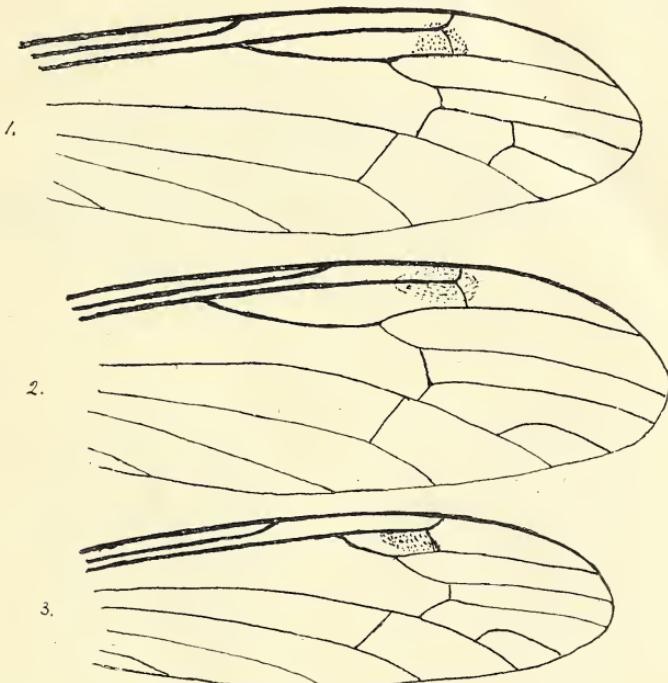


very thin brighter bituminous layers, and furnishes a high-grade furnace and steam coal. Its relatively high carbon percentage ensures great heating power, while the presence of the thin bituminous layers renders it less difficult to ignite than pure anthracite. In addition to the map, there are two excellent illustrations showing shaft sections illustrating the variations in the Barnsley Coal and its Relationship to other Coals.

DICRANOMYIA APERTA WAHLGR.
AN ADDITION TO THE BRITISH DIPTERA LIST.

CHRIS. A. CHEETHAM.

THIS interesting species belongs to a group of *Dicranomyias* which are small in size (body $3\frac{1}{2}$ -5 mm.) and very dark—almost black—in colour; *D. morio* F. being the most frequent.



1.—*Dicranella occidua* Edw.
2.— " *aquosa* Verr.
3.— " *aperta* Wahlgr.

Edwards in the *Ent. Monthly Mag.*, 1926, p. 31, added two others, *caledonica* and *occidua*, the type of the latter being from Ingleton. On the Sedbergh excursion I caught three, which Edwards identified as *aquosa* Verr. This species was collected by Verrall in Inverness and at Bettws-y-Coed. It is a somewhat aberrant species, and the form of the hypopygium and length of the subcostal vein seem to make it much better placed in *Limnobia* than in *Dicranomyia*; the hairs on the apical veins are relatively much longer than in the other species.

On September 3rd, at Austwick, I caught others which

belong to this group. Edwards identified them as *aperta* Wahlgr. This species occurs in Sweden, Finland and Latvia ; it is the smallest of the group, $3\frac{1}{2}$ mm., while *aquosa* is $4\frac{1}{2}$ mm.

Aquosa and *aperta* are easily known from the rest of the British Dicranomyias by reason of their discal cells being open ; they also vary from the typical Dicranomyia venation in the length of the subcostal vein and the position of the origin of the prefurca (the common base of Wingate's Vein 2 and 3). The figures which are drawn to the same magnification show this, the upper wing is that of *D. occidua* Edw. This is the typical venation of the genus, the subcosta terminating above the origin of the prefurca. In the second, *D. aquosa* Verr., the subcosta extends far beyond the origin of the prefurca as in the genus *Limnobia*, and in the third, *D. aperta* Wahlgr., the subcosta is much shorter and terminates much before the origin of the prefurca, this latter being very short.

Verrall's description of *aquosa* is in the *Ent. Monthly Mag.*, 1886, p. 156. Wahlgren described *aperta* in *Arkiv för Zoologi*, Stockholm, 1904 ; and Lundstrom figured the hypopygium in *Acta Soc. Fauna Fennica*, 29, figs. 12, 13.

I am much indebted to Mr. F. W. Edwards for his identifications and for drawing my attention to Lundstrom's paper.

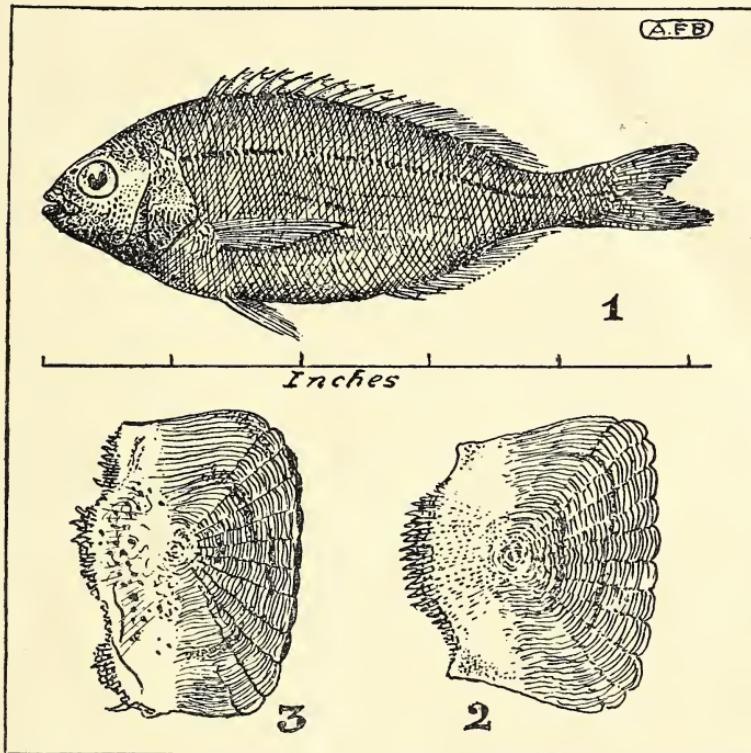
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Hawk Moths and Willow Herb.—I was on the North Downs recently and had the luck to find two almost full-grown larvæ of the Elephant Hawk Moth (*Chæocampa elpenor*) on the stems of *Epilobium angustifolium*. The question then occurred to me as to whether there has been any increase in the number of these insects comparable with the enormous spread of the plant due to the clearing of so much of our woodlands for war purposes a few years ago. The plant has sprung up on many of these cleared areas. Has this made any difference in the numbers of the insect ? Of course, the larvæ will feed on other plants. Mine are now being given their choice of *Epilobium* and *Galium verum*, and they seem to prefer the latter. It is more succulent than the Willow Herb, which is now getting rather dried up, even in wet places. There might have been a repressing factor in 1921, a year of a long spell of dry weather, when many of the cleared areas, just colonised by the *Epilobium*, were burnt by heath fires, and then any larvæ would perish with the plant. The seeds of the plant soon spread to these cleared spaces. Have the moths followed them ? My two larvæ were on a cleared woodland area. A few years ago I found one larva on a burnt Common, where the vegetation was only just beginning to appear in spots after the ravages of a fire which had cleared the place two years previously.—H. J. BURKILL, Leatherhead, Surrey, September, 1927.

THE OLD-WIFE (CANTHARUS LINEATUS).

A. FRASER-BRUNNER.

THE Old-wife, or Black Sea-bream (*Cantharus lineatus*), is among the few British fishes the life-history and habits of which are almost unknown. It is not as yet certain whether the eggs are demersal or pelagic, and newly-hatched specimens have not so far been recognised. No doubt this is partly due



to the fact that the fish really belongs to the Mediterranean region, and is only taken in any quantity on our coasts during two months of the year.

It seems probable that the species breeds in the Mediterranean, though females in spawn are occasionally taken on the British coast.

For a period of about six weeks, in May and June of each year (known to anglers as the Black Bream Season), these fishes are present at Bognor in large shoals, while comparatively scarce at other nearby places. Why Bognor should be the centre of the annual migration is not clear, but it is possible that the formation of the sea-floor may have some

bearing upon it. The Bream are numerous at other points, sometimes well separated, about this time, though not in such large numbers as at Bognor, and it has been suggested that the rocky ledge which extends somewhat erratically along the South Coast may regulate to some extent the movements of the fishes.

The smallest specimen so far recorded, apparently, is one of seven inches, described by Holt as exceedingly small. I have now before me four specimens, the largest of which is five inches long, or, more precisely, 130 mm. (Fig. 1). Two of these I took with hook and line from the stone pier at Weymouth in August of 1926. They are in very good condition, well nourished and without blemish. The third was taken by Mr. F. D. Holcombe, Hon. Secretary of the British Sea Anglers' Society, in July, 1927, and the fourth was sent from Shoreham Harbour in September by a member of the same Society; both of these are somewhat emaciated, probably due to the time which elapsed between capture and preservation.

On arranging these specimens in a series according to the months (viz., July—August—September), there is a difference of 5 mm. between the lengths of the first and second and the second and third (measuring from tip of snout to root of caudal).

Assuming that hatching takes place at the same date in each year, and that rate of growth is even, this places the age of a Black Bream 130 mm. long at 2 years 2 months. But we know that the rate of growth varies as a rule, and that growth in most fishes is more rapid during the earlier stages. If the scales of one of the five-inch specimens be examined, it is seen that two marks, resembling the zone-boundaries of a salmon's scale, divide the anterior half into three sections of equal breadth (Fig 2.). It is difficult to say what causes the formation of these marks, but they do not indicate periods of growth, for the scale of an adult of 280 mm. shows still only the two marks, broken in places apparently by irregular growth, but still bounding fairly even portions of scale (Fig. 3). They are also present, more or less perfectly, in specimens intermediate between the two, and also in other species of *Cantharus*. I may mention in passing that, other methods failing (in badly preserved specimens, for instance), the species of this genus may be distinguished by their scales, which differ in the number of radii and the arrangement of the spines on the 'ctenoid' edge.

By the somewhat difficult process of counting the concentric rings, I find that the scale of the five-inch fish shows about 85, that of the 11-inch approximately 190 rings. In the former the first 20, in the latter the first 23 rings from the

centre, are broad, gradually narrowing outwards to the breadth of the remaining rings, which continue evenly to the edge of the scale.

It will thus be seen that the ratio between the lengths of the fishes and the rings of the scales is practically the same, and that the difference between the periods of rapid growth indicated by the broader rings is represented by only three rings. Reverting now to the 2 years 2 months (26 months) arrived at in the first instance, the ratio $20 : 85 :: 6 : 26$ (approx.) may be arrived at; allowing for double growth during the six months we have $26 - 3 = 23$ months, the approximate age of the fish of 130 mm.

Unreliable though this method must necessarily be, it is as much as can be attained in the absence of definite data. When the small specimen was sent from Shoreham it was stated that the young bream were present in large numbers in the Harbour; metal tags and silver wire were accordingly sent, with instructions to mark as many fishes possible and return them to the sea alive, so that there is just a possibility that in a year or two one or more of them will be retaken and a definite indication of growth obtained.

The 'Black Bream Season' ends in June, when the fishes disappear as suddenly as they arrived. Yet all these young examples were taken during or after July, and two of them as far west as Weymouth, where Black Bream are rarely seen at all. This requires an explanation which I am unprepared to give at present, though I believe that the 'two-year-olds' are present all along the South Coast every year, inhabiting deep water, and only occasionally coming inshore, where if they are caught, they are disregarded by the fishermen on account of their size. Their presence in large numbers at Shoreham Harbour must be regarded as an unusual occurrence.

The colour of these young Bream is brownish on the back, silver on the sides, and white below. The lateral line is marked by a broad black band, and the streaks on the sides are ochreous, not extending the whole length of the body. There is often a yellowish patch between the eyes, as in *Pagrus auratus*, and the vertical fins are suffused with yellow. They are almost perfect miniatures of the adult as regards form, differing in no proportion except that of the pectoral fin, which reaches only to a point vertically in advance of the vent, whereas in adults it reaches to a point vertically above the second anal spine. Old specimens, too, have the teeth blunt and irregular, which normally are even and sharply pointed.

In poorly fed examples, the concavity formed by the frontal bones is visible externally, affecting the profile, while in well conditioned specimens it is filled with tissue, which forms a hump on the forehead.

BOTANICAL SECTION MEETING.

THIS Section was again indebted to Prof. J. H. Priestley for an invitation to meet in the Botanical Department of the University, Leeds, on October 15th.

Prof. Priestley, the President of the Section, in his opening remarks mentioned the great loss the Section had sustained by the death of the Senior Secretary, Mr. J. Fraser Robinson, the members standing to express their agreement. He also mentioned the serious illness of another old member of the Section, Mr. J. Hartshorn, of Leyburn, Divisional Secretary of the Union for North-west Yorkshire. The Secretary was instructed to write to Mr. Hartshorn and express the sympathy of the meeting, and wish him a speedy recovery.

Officers were nominated for the Section and its Committees, and suggestions were made for next year's President, and for Union excursions for submission to the Executive.

The annual reports of the Section and Bryological Committee were then read and adopted.

After a welcome cup of tea, Dr. A. S. Foster, an American visitor to the Botanical Laboratories, gave an interesting account of some work on 'The Relation of Precociously-opening Buds to Bud-scale Morphology.' He showed some wonderful photographs of the development of leaf and bud-scale in *Aesculus*. It is hoped that an account of this work may appear in *The Naturalist*.

This opened the way to the subject of the secondary growth, which has been referred to previously in this magazine, and many members helped in the discussion of the amount and possible causes. Prof. Priestley hopes to summarise this later in these pages.

Mr. A. Malins Smith then gave a short account of the succession of vegetation noted by him at Adel lower dam early this year, when the water was low. At the lowest level he found *Callitricha* and *Ranunculus fluitans*; in the middle zone, with *Peplys*, he noted a very large amount of *Tillaea aquatica*, and he felt sure that if this plant had been there in such quantity previously it must have been seen by the older botanists. Mr. J. Beanland, in reply to a question on this matter, stated that he had visited the place frequently 30 years ago, but he had never known the dam short of water, and thought it would have been impossible to have seen the plant had it been there.

Dr. W. H. Pearsall mentioned that some submerged plants, known by him for some years at Estwaite Water, which were abundant in places when first found, have become quite rare, and he thought that lake vegetation changed very quickly.

Mr. W. P. Winter passed round some views of the Ariège district, in the Pyrenees, that he had visited, and described the vegetation and methods of wood craft and agriculture in use there.

Mr. W. E. L. Wattam showed a series of pressed seedling plants, some native and some foreign, which he had raised from seeds.

The next matter was raised in a letter from Mr. J. R. Flintoff, the botanical recorder for the East Riding. He pointed out that there is no list of Yorkshire plants that is complete and up to date, and suggested that something should be done. A discussion followed, and as it seemed very unlikely that Dr. F. Arnold Lees' supplement could be published for some time, it was decided to ask the Recorders, acting as a Sub-committee, with Mr. Sledge as Secretary, to draw up a list for publication in *The Naturalist* bringing the three floras up to date.—CHRIS. A. CHEETHAM, *Secretary*.

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The Annual Report of the Scottish Marine Biological Association for 1926-7 contains a summary of the excellent work done at that Institution, with details of the memoirs published by the staff, etc.

POLYGAMY AND THE GREGARIOUS HABIT.

J. M. WINTERBOTTOM, B.Sc.

POLYGAMY is that state in which the male of any species of animal has more than one mate at a time.

The purpose of this essay is to discuss whether such a condition has had any influence upon the formation of a gregarious habit—the habit in animals of living together in flocks.

This habit occurs only in three classes of animals: the insects, the birds and the mammals; for the vast shoals of fish that occur from time to time are merely an aggregation of individuals brought together by the accident that they wish to do the same thing at the same time—they have no corporate entity. The same may be said of similar phenomena in other animals, such as *Salpa*, which invades the North Sea in millions; lizards, which may often be found in hundreds on walls, and so on. Nevertheless it would appear that certain snakes, e.g., the English adder, do congregate in small groups during hibernation, thus deriving mutual benefits; but it may well be argued that this is merely due to a number of snakes independently choosing the same spot in which to pass the winter.

Among insects, gregariousness occurs in the termites, the wasps, the bees and the ants, but in none of these cases is there any evidence of polygamy. Indeed, the death of the male in the act of impregnation, which occurs in many of the *Hymenoptera*, would effectually bar any such state obtaining in those cases.

There remain, then, the birds and the mammals. Now there can be little doubt that the unit from which a flock or herd is built up is the family, and that an aggregation of individuals forming a herd is brought about by an extension of the tendency of a family party to keep together for mutual protection or aggression. At first sight, therefore, it would appear that polygamy, by increasing the size of the family, would tend to produce true gregariousness. But is this really so? A consideration of the various cases of polygamous animals will, I think, conclusively show that such is not the case.

Among the birds, polygamy is the rule among the game-birds (though there are many exceptions), the ostriches and the rheas. In the two last-named cases the male incubates (or guards) the eggs of all his consorts; and some approach to true gregariousness takes place; for both these types of bird not only form small communities of their own species, but join up, in the one case with various antelopes and zebras,

and in the other with guanacos and deer, to form the remarkable 'mixed herds' about which travellers have so often written.

Other cases of the male performing the domestic duties occur in the phalaropes, and, in fish, in the sticklebacks; but in both these cases polyandry seems to be the condition, and in neither has it led to the formation of any true gregarious habit.

The game-birds provide an entirely different set of circumstances, for here each hen-bird makes her own nest. In such a case, it would manifestly be impossible for the male to take charge of all the broods he has fathered; in actual practice he takes no interest in them at all. Further, except in the breeding season, the sexes live apart, a condition which occurs in many polygamous animals (*e.g.*, the sheep). Another interesting feature about polygamous birds is that none of them (except the doubtfully-polygamous birds of paradise) builds any elaborate nest, but lay their eggs on the ground.

In those of the game-birds which do not exhibit polygamy, *e.g.*, the partridge, the family holds together during the winter, but breaks up with the approach of spring. In the other condition, the offspring frequently keep by the mother-bird until the winter is over, for there never seems to be a second brood. This is probably owing to the fierce fights and elaborate courtship that accompanies mating. It would be too great a strain on the bird, and would take up too much time to go through this process twice in one summer.

If we turn to the mammals, the same conditions obtain. The sheep have already been cited; similar habits are exemplified by some of the antelopes and deer. Except in the case of the dog, where it is very probably the result of domestication, no carnivorous land mammal is polygamous.

Although there are a few exceptions—the ostrich forms a partial one—an inquiry into the effect of polygamy on the gregarious habit tends to bear out the statement that the two are antagonistic rather than correlated, and it seems fairly safe to assume that where the two habits do occur together, the animal is gregarious in spite of polygamy, and not because of it. Polygamy intensifies the disruptive force of jealousy, and thus tends to break up the assembly by driving out the weaker males to live by themselves. The highest forms of gregarious animals—the rooks and weaver-birds, in the birds; the baboons, elephants and wolves, in the mammals—are monogamous. In the case of the latter, and in many other animals, the beasts are only gregarious in the non-breeding season. Now there is no breeding season in man. Hence it would seem probable that primitive man was also monogamous, and that polygamy, where it occurs, is a later,

secondary development, made possible by the introduction of agriculture and domestic animals, which enabled one man to support more than one family. In this connection it may be noted that the non-agricultural, hunting Esquimo is monogamous.

Finally, a word might be said of the effect of domestication in inducing polygamy in normally monogamous animals, such as the duck, the canary, the dog and the cat. Two causes are operative. In the first place, the male has not, under domestic conditions, to assist his mate to rear the offspring. This operates strongly in the last three instances cited above, though not at all in the first. Secondly, the animals have not to seek their own living. This releases a flood of energy which can be diverted to sexual uses—a similar phenomenon is an historical commonplace in the immorality of the 'idle rich' class of every great civilisation. Such a state of things leads to the weakening of the family ties, and hence to the destruction of unit of construction of the community.

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Episodes from the story of Mankind, by **Henrik Van Loon**. London : G. G. Harrap & Co., 192 pp., 1/6. This little volume is an abbreviated edition of 'The Story of Mankind,' published in 1922, and is issued in this smaller form and cheaper price, which will doubtless be popular. The author begins with The Nile Valley ; The Rise and Fall of Egypt ; Mesopotamia, etc., and ends up with the French Revolution, and Napoleon.

Scientific Paradoxes and Problems, by **A. S. E. Ackermann**. London : The Old Westminster Press, Regency Street, S.W.1., viii. + 131 pp., 5/- net. To those who are fond of problems and puzzles this work will strongly appeal. It contains a series of talks on popular fallacies connected with engineering and science, broadcasted by the B.B.C. The following may be taken as a sample : 'A man is on a walking tour. He comes to a place where five roads meet, and finds that the sign-post is lying in a ditch. There is nobody in sight, it is a dull day, and he has no compass. How may he determine which road to take in order to reach the town he set out for ?' Answer : Re-erect the sign-post with the proper hand pointing to the road by which he has just reached the five ways !

Popular Fallacies, by **A. S. E. Ackermann**. London : The Old Westminster Press, xvi. + 984 pp., 12/6 net. The same author has issued a much more substantial volume under this title. The fact that a third edition of this work of 1000 pages has been called for is evidence of its popularity. He begins with a remarkable series of quotations on 'Errors,' by various authorities. His popular fallacies are under the heads of Domestic, Ourselves, Animal Kingdom, Mineral Kingdom, Vegetable Kingdom, Astronomy, Biology, Biography, Literature, Etymology, Geography, Law, History, Music, Engineering and Science, Statistics and Numbers, Weather, and General Misinformation. Taking the Animal Kingdom, for instance, we should like to quote a number of them, but will be content with the first three, namely : 'That a Mad Dog avoids Water, and that More Dogs go Mad in the so-called "Dog Days" than during any other Period' ; 'That Whale-bone is True Bone, and that it is Found in all Whales' ; and 'That a Cat sees better in the Dark than in the Light.'

ALLERTHORPE COMMON.

F. A. MASON, F.R.M.S., AND T. STAINFORTH, B.A., B.SC.

(Continued from page 309).

Mr. Hincks obtained the following species of Diptera, etc. :—

DIPTERA.

<i>Rhamphomyia flava</i> Fln.	<i>Helomyza notata</i> Mg.
<i>Eristalis pertinax</i> Scop.	<i>Urophora solstitialis</i> L.
<i>Platychirus peltatus</i> Mg.	<i>Oxyphora flava</i> Geoff.
<i>Sicus ferrugineus</i> L.	<i>Pleropætria frondescens</i> L.
<i>Zodion cinereum</i> F.	<i>Micropeza corrigiolata</i> L.
<i>Hydrotæa irritans</i> Fln.	

NEUROPTERA.

Raphidia xanthostigma Schum.

HYMENOPTERA.

<i>Allantus arcuatus</i> Först.	<i>Tenthredo mesomela</i> L.
	<i>Tenthredopsis elegans</i> Knw. (?)

PLANT GALLS (W. Falconer).—Judging from the results obtained by the five members of the Plant Gall Section who attended the meeting, during the short time available for investigation, Allerthorpe Common and its vicinity deserve a much more extended visit. Fifty-nine different forms were met with; these, and many others obtained by the writer during the following week in another part of the East Riding, will be enumerated in a future article in *The Naturalist*.

ARACHNIDA (W. Falconer).—Several species of spiders previously reported from the common were again met with, including the county rarities, *Xysticus sabulosus* Hahn and *Singa pygmæa* Sund., both again females. Of the 44 other kinds which are not definitely recorded for the locality in the *Spiders of Yorkshire*, the most noteworthy were *Clubiona neglecta* Cb., *Crustulina guttata* Wid. and *Entelecara erythropus* Westr. In the following list 'B' stands for Barmby Moor village, 'F' for the Frog Hall portion of the Common (where the writer spent some time on the previous day), and 'A' for the route over the Common followed by the general body of naturalists on July 2nd.

SPIDERS.

<i>Amaurobius similis</i> Bl. B. ♀s.	<i>Porrhomma pygmæum</i> Bl. A. ♂
<i>A. fenestralis</i> Ström. F. A. ♀s.	<i>Cornicularia unicornis</i> Cb. A. ♀
<i>Dictyna arundinacea</i> Linn. A. ♀s.	<i>Bathyphantes parvulus</i> Westr. B.
<i>D. uncinata</i> Westr. A. ♀s.	♂s. ♀s.
<i>Theridion bimaculatum</i> Linn. F. ♀	<i>B. pullatus</i> Cb. F. A. ♀s.
<i>T. sisyphium</i> Clerck. A. F. ♀s.	<i>B. gracilis</i> Bl. F. A. ♂, ♀s.
<i>T. ovatum</i> Clerck and var. <i>redimitum</i> Koch. A. B. ♂s, ♀s.	<i>Micryphantes saxatilis</i> Bl. ♂, ♀s.
<i>Crustulina guttata</i> Westr. A. ♀	<i>Ero furcata</i> Vill. A. ♀
<i>Robertus lividus</i> Bl. A. ♀	<i>Zilla x-notata</i> Clerck. B. ♀s.
<i>Tiso vagans</i> Bl. B. ♀s.	<i>Tetragnatha extensa</i> Linn. A. ♂
<i>Erigone atra</i> Bl. A. ♀	<i>Pachygnatha clerckii</i> Sund. A. ♂, ♀
<i>Lophomma punctatum</i> Bl. A. ♀	<i>P. degeerii</i> Sund. B. ♂
<i>Cnephalocotes obscurus</i> Bl. A. ♂	<i>Meta segmentata</i> Clerck. B, A. F. ♀s.
<i>Dismodicus bifrons</i> Bl. B. ♀s.	<i>Epeira diadema</i> Clerck. B, A. ♀s.
<i>Edothorax retusus</i> Westr. A. ♀	<i>E. cucurbitina</i> Clerck. B, A. ♀s.
<i>Peponocranium ludicum</i> Bl. F. A. ♀s.	<i>Tibellus oblongus</i> Walck A. ♀
<i>Entelecara erythropus</i> Westr. A. ♀	T. Stainforth ♂ W, F.

- Xysticus cristatus* Clerck. ♀s. B, A, F.
Philodromus aureolus Clerck. A. ♀s. ♂.
P. cespiticolis Walck. A. ♀s. ♂.
Clubionia lutescens Westr. F, A, B. ♀s.
C. neglecta Cb. A. ♀.
- Clubiona reclusa* Cb. B, A. ♂, ♀s.
C. diversa Cb. B, A, F. ♂s, ♀s.
C. trivialis L. Koch. A. ♀s.
Zora spinimana Bl. A. ♀s.
Lycosa pullata Clerck. F, A, B. ♂s. ♀s.
L. amentata Clerck. B, A. ♂, ♀s.
Pirata piraticus Clerck. A. ♀s.

FALSESCORPION.

Obisium muscorum Leach. A, 2 examples.

HYMENOPTERA-ACULEATA (W. J. Fordham).—The following aculeates have been taken by myself on Allerthorpe Common, East Yorks. :—

†*Odynerus crassicornis* Pz. One specimen of what Mr. R. Butterfield and I think is this species, 3/8/24. This is one of our rarer *Odyneri*, and little is known of its habits.

†*Sphecodes reticulatus* Th. A female, 21/5/17. This bee is parasitic on *Andrena argentata* Sm., which has not yet been discovered in Yorkshire, but is locally abundant on the Surrey, Berkshire and Hampshire Commons, and probably may be found at Allerthorpe.

†*Halictus decipiens* Perk. Two females, 19/5/27, which Mr. Butterfield thinks is this species. It is a widely-distributed species.

**Andrena chrysosceles* Kirby. A male, 21/6/25. A local species.

**A. fulvago* Christ. 17/4/27, 23/5/27. A local bee also, preferring sandy situations.

**A. lapponica* Zett. A moorland species, common on the moors near Bradford. One specimen, Allerthorpe, 4/27.

†*A. præcox* Scop. A male, 20/4/24. An early species.

**A. wilkella* Kub. One specimen, 6/26.

I am greatly indebted to Mr. Rosse Butterfield for kind help in the determination of these species. The asterisk denotes a new Vice-County record, and the dagger a new County Record.

DIPTERA ON ALLERTHORPE COMMON.—(W. J. Fordham):—The following are records of flies found by the writer in this locality. I am indebted to Mr. J. E. Collin for kindly naming most of the species. The dagger and asterisk indicate New County and Vice-County records respectively.

†*Rhamphomyia filata* Ztt. ♀, 6/26.

**R. subcinerascens* Collin (*cinerascens* Verr. list). 1♂, 2♀, 4/27. An early species.

†*Hilara gallica* Mg. ♂, 6/26. A grey species with yellow legs. This fly is not yet recorded for Britain.

**H. interstincta* Fln. ♀, 6/26.

**Porphyops crassipes* Mg. ♀, 21/5/27.

**Chilosia impressa* Lev. ♀, 13/8/25.

**C. longula* Ztt. ♂, 12/8/23.

**C. nigripes* Mg. (*antiqua* Verr. list). 2♂s, 6/26.

**C. ruralis* Mg. (*præcox* Ztt.). 2♂s, 22/4/27, 21/5/27.

**Melanostoma ambiguum* Fln. 2♂s, 14/4/27, 23/4/27. A spring species.

†*Syrphus punctulatus* Verr. ♀, 14/4/27. Another early species.

**Morinia nana* Mg. ♂, ♀, 8/24.

†*Chortophila discreta* Mg. 2♀s, 6/26.

**C. varicolor* (Mg.) Collin, 1♂, 3♀s, 6/26.

**Egle (Phorbia) muscaria* Mg. ♂, 13/4/27.

**Fannia incisurata* Ztt. ♀, 4/27 (Barmby Moor).

**Lasiomma meadii* Kow. ♀, 6/26. This insect has been bred at Oxford from old birds' nests.

**Lasiops semicinereus* Wd. ♂, 2♀s, 6/26.

†*Mydæa calceata* Rdi. ♂, 6/26. This insect is also new to Britain.

**Mydæa depuncta* Fln. ♀, 6/26.

†*Pegomyia tenera* Ztt. 2♀s, 18/6/21. Added to the British list by A. E. J. Carter. (*Scottish Naturalist*, 1916, 262.)

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Albino Weasel in Lancashire.—On the 18th September an albino Weasel was killed at Thornham, near Oldham, and was given to the Oldham Museum two days later. It is an adult male weighing 4½ ounces, 11 inches in length. The fur everywhere is entirely white, but the eyes dark and not pink. Albinism is not rare in the Mustelidæ, and I have known instances in both weasel and stoat. This fact is worth bearing in mind when encountering records of stoats in 'white winter dress' seen in summer or early autumn.—FREDK. J. STUBBS.

Cephalozia loitlesbergeri Schiffn. in Yorkshire.—This hepatic has been discovered for the first time in Yorkshire on Hellwith Moss, near Austwick (V.C. 64). It was originally discovered in England by A. Wilson and the late J. A. Wheldon on Cockerham Moss, Lancashire, and it has since been found in various localities in Scotland, and also near Kilkhampton, in Cornwall. The chief points of difference from the allied *C. macrostachya* are that it is monoicous, has longer cilia at the mouth of the perianth, and the leaf-lobes more incurved and frequently over-lapping.—F. E. MILSOM.

Acanthosoma hæmorrhoidale and Sirex gigas in Sheffield.—A specimen of the Hemipteron, *Acanthosoma hæmorrhoidale*, apparently recently emerged, was taken in a house at Nether Edge, Sheffield, during September. This insect, rare in the north, has apparently only been recorded on three previous occasions for Yorkshire (see *The Naturalist*, 1921, p. 334, and 1924, p. 219), and not yet for the neighbouring county of Derbyshire. Its usual food plant appears to be the hawthorn. Earlier in the same month a female *Sirex gigas* also entered a house at Millhouses, Sheffield.—J. M. BROWN.

Death's-Head Hawk Moth near Goathland.—On the 14th September, 1927, at Beck Hole, I saw a Death's-head Hawk Moth, which had been captured on the early morning (2 a.m.) of the preceding day by Miss N. Carter. It flew through the open window of her bedroom. It measures nearly five inches across the expanded wings from tip to tip, the length of the body being 2½ inches. The colours are well and clearly defined. Mr. G. Harrison, of Beck Hole, tells me that when he was a little boy he remembers his father catching one of these moths as it was on the point of entering one of his beehives of the old-fashioned straw-skep kind. This happened at Hawske, near Whitby, about fifty years ago.—R. J. FLINTOFF.

PLANT GALLS FROM EAST YORKSHIRE.

WM. FALCONER, F.E.S.

EXCEPT for three noteworthy forms incidentally mentioned by Dr. Fordham in *The Naturalist*, January and February, 1919, the published records of plant galls from V.C.61* have arisen from passing visits paid to it by outside workers, so that the list at present is neither long nor exhaustive. The Union Meeting at Allerthorpe afforded an opportunity of investigating hitherto unworked areas in it, July 1st at Barmby-on-the-Moor and Frog Hall, July 2nd along the route followed by the general body of naturalists across the Common, and the succeeding week in the Rillington district in the North-west of the Riding. Many interesting forms were met with; six asterisked in the list are new to Yorkshire, and more than half of the rest apparently receive the first specific mention of their occurrence in V.C.61, but because of the general distribution of some of them, only the uncommoner ones are distinguished by a dagger. The previous county records are in a few cases added.

HYMENOPTERA.

Pontania proxima Lep. On *Salix fragilis*, Barmby Moor, and brickworks, Rillington; on *S. alba*, Barmby Moor; on *S. aurita*, Allerthorpe Common; on *S. cinerea*, Frog Hall and Rillington brickworks; on *S. caprea*, West Moor Lane at Rillington.

Cryptocampus ater Jur. On *S. cinerea*, near Frog Hall.

The next seven on oak.

Andricus curvator Htg. On leaves, Frog Hall, Thorpebassett, Thorpe House, near Rillington brickworks, Knapton Wold.

†*A. nudus* Adler. On fallen male catkins, Scampston Park. Reported previously from near Masham.

A. pilosus Adler f. *fecundator* Cam. Barmby Moor and Allerthorpe Common.

Biorrhiza pallida Oliv. Barmby Moor, Thorpebassett, fields; West Moor Lane in hedges.

Neuroterus baccarum Linn. On leaves plentifully, Frog Hall, Allerthorpe Common, Scampston village and park, Bassett House, West Moor Lane, Knapton Wold.

N. vesicator Schl. Near Frog Hall, Bassett House, Knapton Wold.

Cynips kollari Htg. Frog Hall, field hedges West Moor Lane, Knapton Wold.

Rhodites rosae Linn. Near Frog Hall, Rillington and Scampston.

DIPTERA.

Rhabdophaga salicis Schrank. On *Salix cinerea* near Frog Hall.

†*R. albipennis* Winn. On *S. repens*, Allerthorpe Common. F.A. Mason.

†*R. nervorum* Kieff. On *S. cinerea*, Rillington.

Iteomyia capreae Winn. On *S. aurita*, fields near Rillington brickworks.

I. capreae var. *major* Kieff. On *S. cinerea*, near Frog Hall.

†*Harmandia tremulae* Winn. On one bush of aspen near Frog Hall. Reported previously from the Huddersfield area.

* Vide *The Naturalist*, December, 1918, and April, 1922.

- Macrodiplosis dryobia* F. Löw. On oak, Frog Hall, West Moor Lane, and brickworks at Rillington.
- †*Oligotrophus ulmi* Kieff. On wych elm, Barmby Moor, Scampston, and Bassett House.
- Dasyneura sisymbrii* Schrk. On *Nasturtium sylvestris* Druce, Surton-upon-Derwent, W. H. Burrell. Previously recorded for Bubwith by Dr. Fordham.
- Perrisia urticae* Perr. On *Urtica dioica*, Barmby Moor, Rillington, and Knapton Wold, commonly.
- P. ulmariae* Brmi. On meadow sweet, Barmby Moor, Allerthorpe, and Rillington districts.
- P. plicatrix* H. Löw. On brambles, Allerthorpe, Scampston, Rillington, and Knapton districts.
- P. rosarum* Hdy. On *Rosa canina*, Rillington, Wintringham, and Thorpe Bassett.
- P. crataegi* Winn. As in most other areas, plentiful and widely distributed.
- P. lathyricola* Rübs. On meadow vetchling, Knapton Wold.
- P. fraxinea* Kieff. On ash, Allerthorpe and Rillington.
- P. fraxini* Kieff. On ash, Allerthorpe, Thorpe Bassett, Wintringham, Knapton, and Scampston.
- P. veronicae* Vallot. On germander speedwell, generally distributed.
- †*P. aparines* Kieff. On goosegrass, West Moor Lane plantation, Rillington. Reported previously from the Huddersfield area.
- P. galii* H. Löw. On *Galium verum*, Rillington, Scampston Mill, and Knapton.
- †*P. galicola* F. Löw. On *G. verum*, Rillington and Scampston Mill.
- Contarinia tiliarum*. On broad-leaved limes, Barmby Moor, Allerthorpe Bassett House, and Scampston Park.
- **Trotteria galii* Rübs. On *G. verum*, Knapton Wold. Apparently the first definite record for Yorkshire.
- Urophora solstitialis* Linn. On black knapweed, near Frog Hall and West Moor Lane, Rillington.
- †*Macrolabis pilosellae* Binnie. On *Hieracium pilosella* L., Knapton Wold, many examples. A local species previously recorded from Redcar.
- M. corrugans* F. Löw. On hogweed, Frog Hall, and near Rillington station.
- **Stictodiplosis pilosellae* Kieff. On *H. pilosella*, Knapton Wold, many examples with the last named on the same field ridge. The second record for the North of England at least, having previously occurred in County Durham.

HOMOPTERA.

- **Pemphigus pallidus* Halliday. On wych elm, Barmby Moor, tree overhanging stream. Unable to find any other Yorkshire record.
- †*Myzocallis quercus* Kalt. On oak, Knapton Wold.
- Schizoneura ulmi* Linn. On *U. montana* and *campesiris*, mostly the former, Barmby Moor, Scampston, West Moor Lane, and Thorpe Bassett.
- Aphis rumicis* Linn. On *R. obtusifolius*, Barmby Moor, Bassett House, and West Moor Lane (Rillington).
- A. padi* Linn. On Blackthorn, Barmby Moor and Allerthorpe, Rillington and Bassett House. On bird cherry, Allerthorpe.
- A. pyri* Fonsc. On crab-apple, Rillington. On hawthorn (*A. crataegi* Kalt.), village, near station and brickworks at Rillington.
- A. viburni* Scop. On guelder rose, West Moor Lane plantation, and near brickworks, Rillington.
- Myzus ribis* Linn. On gooseberry, Barmby Moor.
- Hyalopterus pruni* Fabr. On plum leaves in a garden at Rillington.

Psylla buxi Linn. On box, Barmby Café, Scampston, village and park, and Rillington.

†*Trichopsylla walkeri* Förster. On *Rhamnus frangula*, West Moor Lane at Rillington, plentiful in one spot. Reported previously from Scampston Moor by Mr. Burkitt.

Psyllopsis fraxini Linn. On ash, common, and generally distributed. *Rhopalosiphum ribis* Linn. On black and red currant bushes, Barmby Moor. On the former in gardens at Rillington, abundant.

†*Hyadaphis xylostei* Schrank. On common honeysuckle, abundant at Barmby Moor Café.

ACARI.

Eriophyes psilaspis Nal. 'Big bud' on yew, Scampston.

E. rufis Can. 'Big bud' on birch, Allerthorpe Common and near Frog Hall.

†*E. ?spec.* On *Salix alba*, S. 56 Houard, Barmby Moor and Rillington. *E. similis* Nal. On blackthorn, near Rillington brickworks.

E. pyri Pgnst. On mountain ash, several places near Frog Hall.

E. goniothorax Nal. On hawthorn, near Frog Hall, Scampston, Bassett House, Rillington brickworks.

E. macrorrhyncus Nal. On sycamore, Scampston village and park, West Moor Lane and brickworks at Rillington.

E. tiliæ Pgnst. var. *liosoma* Nal. On broad-leaved limes, Barmby Moor, Scampston and Bassett House.

**E. minor* Nal. On wild thyme, Knapton Wold, many examples. A rare species, new to the county and on record for one locality in Cumberland, Westmorland and Lancashire respectively.

E. galii Karp. On goosegrass in a field between West Moor Lane and Rillington.

E. laevis Nal. and *E. brevitarsus* Fckn. On alder, both West Moor Lane. *E. nalepai* Fckn. On alder, near Frog Hall, West Moor Lane and Scampston Mill.

E. avellanae Nal. 'Big bud' on hazel, Allerthorpe Common, brickworks and field hedges at Rillington.

†*E. ? spec.* Houard No. 2045, on elm, Barmby Moor and Scampston.

†*E. atrichus* Nal. On *Stellaria graminea*, a large patch near Frog Hall. Previously recorded from Huddersfield area.

†*E. tuberculatus* Nal. On tansy in a field between the brickworks and Rillington village. One record previously from the Huddersfield area.

**E. lioproctus* Nal. On *Senecio jacobæa*, Allerthorpe Common. F. A. Mason. Apparently the second record for the North of England at least, having first been noted for Penshaw Hill, County Durham.

†*Phyllocoptes acericola* Nal. On sycamore, hedges, bushes, Scampston and West Moor Lane.

†*P. gymnaspis* Nal. On sycamore, Barmby Moor, Scampston and Rillington brickworks.

†*Phyllocoptes epiphyllus* Nal. Lines of abnormal hairs on veins beneath leaves of ash, Barmby Moor, Scampston and near Rillington station.

**Epitrimerus cristatus* Nal. On oak, near Frog Hall, and near Rillington brickworks. Second British record, having first occurred at Grange-over-Sands. A hitherto unreported example was found in the Coxley Valley, V.C. 63, in 1922.

Epitrimerus trilobus Nal. On elder, Barmby Moor.

FUNGI.

Taphrina aurea Fries. On black poplar, in a garden at Rillington. On the aspen, West Moor Lane.

†*Puccinia coronata* Corda. On *Rhamnus frangula*, West Moor Lane,

Rillington, plentiful on leaves. Previous record on this plant, Askham Bog.

Puccinia poarum Niels. On coltsfoot, Barmby Moor, and Rillington.
Cystopus candidus Lév. On shepherd's purse, Rillington 'sands.'
Urocystis anemones Pers. On creeping buttercup, Barmby Moor.
Nectria ditissima Tul. 'Apple canker,' in a garden at Knapton Wold.
Phragmidium mucronatum Schlecht. On *Rosa canina*, Thorpebassett.

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CORRESPONDENCE.

GAPING GHYLL.

On Saturday, September 3rd, and the following day, forty members of the British Association for the Advancement of Science enjoyed a very unusual form of hospitality. The hosts were the members of the Yorkshire Ramblers' Club, who were 'at home' in the main shaft, chambers and passages of Gaping Ghyll.

The descent of that pot-hole (main-shaft 350 ft.) is no work for the amateur. The convenient bosun's chair method requires considerable preparation and the operation of a party of experts. Surface water has to be diverted, a motor winch, gantry and bosun's chair rigged, a guy-line for the chair, and a telephone installed. The Club provided each guest with an outfit of oil-skins, an acetylene lamp, hot food for the hungry, and changing tents for the refined, all of which had been laboriously hauled up the hillside for the party's comfort and convenience. For two days the descents and ascents continued, each guest being allowed about three hours below.

Arrived in the cathedral-like Main Chamber, each group of four guests and two hosts set off to see as much of the heart of Ingleborough as the time schedule allowed. The writers' party, led by Messrs. E. E. Roberts and A. E. Horn, went by the South Passage, past the 'Canal,' to the T-junction, thence through the 'Sand Cavern,' Stalactite Chamber and 'Stream Chamber,' travelling in all about a mile and a half underground. It is impossible adequately to describe the scenery of that under-world, with its glittering stalactites, fan-tracery, rock-barriers, streams, 'pots' and 'belfries.' The guide-book and plan with which each member of the British Association was provided are the work of the Yorkshire Ramblers; the plan, recently completed, being the result of about 20 years of exploration and survey. Gaping Ghyll apparently possesses a fauna, for our party surprised, but failed to capture, a living bat at a considerable distance from the main-shaft—in the alcove at the top of the pitch beyond the 'Sand Carven.' No living creature had previously been seen by our guides in Gaping Ghyll, and the suggestion has been made that the occurrence of this specimen, which may have come in to hibernate, is possibly an indication of the existence of a dry route (dry at least for a bat) to Clapham Cave, since bats are common in that district, but are scarce on the moors above. This journey, together with a visit to the West Chamber and 'Letter Box,' occupied all the available time, and then began the journey up the guy-line to the surface.

A delightful feature of the expedition was the personal contact with those who entertained us with many reminiscences of the original exploration and survey; and the members of the Association who were privileged to be present will always remember their great day with the Yorkshire Ramblers' Club.—M.M.B., C.K.I.

COUNTERSTAINING MICROSCOPICAL PREPARATIONS WITH LIGHT GREEN.

Since the publication of my note in this journal, December, 1926, on staining techniques, I have received enquiries as to the permanence of

the Light Green stain. At the recent meeting of the British Association I was informed that many sections thus stained faded in a year or two. Neither Mr. Barnett nor I wish to assert that the stain is permanent, but we agree that all our sections stained by this method during the last five years have kept perfectly. We always wash the sections two or three times in absolute alcohol, *after* differentiating with absolute alcohol and clove oil, and *before* transferring to xylol. By this method all traces of clove oil, to which we attribute fading, are removed, and, in addition, we store our slides in the dark, as light may affect the permanence of some of the stains.—G. A. C. HERKLOTS.

PHOTOGRAPHS ILLUSTRATING PHASES OF BRITISH BOTANY.

During the past few months an attempt has been made to form a collection of photographs illustrating the various phases of British Botany. With this object in view I wrote to many of the leading English botanists asking for photographs illustrating their particular sphere of work. The response has been generous. The photographs (for the most part 10 ins. by 8 ins.) have been suitably mounted with a legend giving particulars, and have been framed in oak. These pictures (75 to date) have been scattered throughout the various branches of the department. The collection includes :—

I. ECOLOGY.—(a) *Moorland Scenes*. Contributions dealing with Yorkshire moors have been received from Dr. T. W. Woodhead and Mr. A. I. Burnley. A particularly interesting set has been received from Dr. E. Pickworth Farrow, showing the effect of rabbits on the flora of Cavenham Heath, East Anglia. (b) *Sand Dunes and Salt Marshes* (Yorkshire and Norfolk), Mr. A. I. Burnley and Dr. H. Hamshaw Thomas. (c) *Woodland Scenes*, Dr. T. W. Woodhead, Mr. W. R. Grist and others. (d) *Plants in their Natural Environment*, Mr. A. I. Burnley, Yorkshire plants, and Mr. B. A. Lowe, Cambridge plants. (e) *Foreign types of Vegetation*, Dr. T. F. Chipp, of Kew, has lent photographs illustrating types of African vegetation. Prof. J. H. Priestley has contributed photos of Californian trees and desert scenes.

II.—MYCOLOGY.—Contributions illustrating the Ecological relationships of Fungi to their Environment have been received from Mr. F. A. Mason. Mr. A. E. Peck has added to the value of this collection by placing at our disposal a large number of negatives of his excellent and well-known photographs of Fungi.

III.—ALGOLOGY.—This section has been opened by Prof. F. E. Fritsch (President of Section 'K' at the recent British Association Meeting), who has supplied photographs of 'Yellow Snow' from the Antarctic, and pictures shewing the growth of Cyanophyceæ on rocks.

IV.—EXPERIMENTAL.—In this section can be placed photo micrographs illustrating features of plant anatomy. Through the courtesy of Dr. H. Hamshaw Thomas I have obtained several aerial photographs of Blakeney Point, Norfolk, taken at an altitude of 7000 feet. These, when fitted together, formed a map shewing the distribution of the vegetation of shingle beaches, sand dunes and salt marshes respectively over the whole of the Point, and make a valuable and unique addition to the Ecological collection. We should be pleased to show the collection so far established to anyone interested.—G. A. C. HERKLOTS, Leeds University.

—: o :—

The New Phytologist for September includes the following items : 'Ecological Evolution of the Angiosperms,' by J. W. Bews; 'Discontinuous Generic Distribution in the Angiosperms,' by Ronald Good; 'Vascular Abnormalities in the Aerial Stem of *Psilotum triquetrum*,' by H. S. Holden; 'Useful Devices for the Teaching of Elementary Plant Physiology,' by B. Barnes, etc.

NEW NATURAL HISTORY BOOKS.

If the increased study in nature is to be judged by the number of books recently appeared dealing with various aspects of natural science it is clear that at the present time interest in that subject is as keen as ever it was.

Evidently for young people is a large volume with beautifully-coloured illustrations and excellent sketches dealing with the more important animals of the world (**The Book of Animals**, by **F. M. Duncan and Lucy T. Duncan**. London : T. Nelson & Sons, 95 pp., 2/-). Nearly fifty species are described in detail, the first half dozen being the Lion, Tiger, Leopard, Wild-cats, Orang-Utan, Diana Monkey, and the remainder of a similar type.

Of a similar popular description, but obviously written for more



The Otter.

mature naturalists, is **All About Animals**, by **Lilian Gask** (London : G. G. Harrap & Co., 262 pp., 7/6 net). Here again the principal species of mammals in various parts of the world are described in detail, and as in the previous instance, tremendous additional interest is given. The various species are arranged in alphabetical order beginning with Aardvark, Agouti, Alpaca, Anoa, Ant-eaters, Antelope, and ending with Wolf, Wolverine, Wombat, Yak, Zebra, and Zorilla. We are able to reproduce one of the illustrations herewith.

Richard Jefferies always appeals to our readers, and we are glad to draw attention to a well-printed and remarkably cheap edition of **Wild Life in a Southern County** which Messrs. T. Nelson & Sons have put on the market for 2/-. With nearly 400 pages and a cover with a coloured representation of bird life, our readers can easily be supplied with several hours profitable and pleasant reading for a very low price.

Another popular author, **W. H. Hudson**, is also being reprinted

extensively, and Messrs. Duckworth & Co. have brought out his well-known **Birds and Man** (252 pp.) at the low price of 3/6.

A companion volume from the same house, **The Sea and the Jungle**, by **H. M. Tomlinson** (320 pp., 3/6), is a narrative of the voyage of the tramp steamer, *Capella*, from Swansea to Santa Maria de Belem do Grao Para, in the Brazils, and then 2000 miles along the forests of the Amazon and Madeira rivers to the San Antonio Falls ; afterwards returning to Barbados for orders, and going by way of Jamaica to Tampa, in Florida, where she loaded for home. Done in the years 1909 and 1910.

The work of another popular writer, **J. Henri Fabre**, is also appearing at a very low price from the press of Messrs. Hodder & Stoughton. This is entitled **Life of the Fly**. Here again a volume of over 300 pages, with coloured representation of a fly considerably enlarged, on the cover, is sold at the nominal price of 2/6.

The Beaver, a one-time inhabitant of the British Islands, is monographed by the American Society of Mammalogists, **E. R. Warren**, of the Roosevelt Wild Life Forest Experiment Station, describing **The Beaver : Its Work and Its Ways** (London : Bailliere, Tindall & Cox, xx.+177 pp., 13/6 net) in a series of 13 chapters. The author begins by giving detailed osteological and anatomical descriptions of the Beaver, then refers to its ancestry, distribution, place-names, etc. The extraordinary way in which this animal alters the landscape by the construction of dams is carefully described and illustrated by numerous photographs.

Messrs. Witherby have brought before ornithologists still another monograph dealing with the birds of a particular area, in this instance **The Birds of the Island of Bute**, the author being **John Morell McWilliam** (128 pp., 8/6 net). He gives descriptions of 168 species in that island, with photographs of many of them. In this way Messrs. Witherby are gradually monographing the avi-fauna of the British Islands, and the present volume is not behind some of its predecessors in interest.

Junius Henderson seems to have done for North America what Collinge has done for Great Britain, and in a comprehensive and excellent work on **The Practical Value of Birds** (London : Macmillan & Co., xii.+342 pp., 10/6 net), the author gives the contents of stomachs of myriads of fowl, and points out how crops and forests have been saved by birds, how they have been destroyed for various purposes ; their value as food, and so on. Reference is supported by footnotes, of which sometimes as many as 478 appear to a single chapter. There is also a bibliography consisting of about thirty pages and an excellent index.

From Messrs. Kegan Paul, Trench, Trubner & Co., Ltd., we have received a little volume entitled **Galatea, or the Future of Darwinism**, by **W. Russell Brain** (95 pp., 2/6 net). In this case the publishers inform us that this non-technical but closely-reasoned book is a challenge to the orthodox teaching on evolution known as Neo-Darwinism. The author claims that, although Neo-Darwinism theories can possibly account for the evolution of forms, they are quite inadequate to explain the evolution of functions. This argument is illustrated by a series of concrete examples. The author then indicates the lines along which a more complete and more rational evolutionary doctrine may develop. The volume should be read in connection with Professor G. S. Jennings' *Prometheus* (in this series), which considers the problems of Heredity and Environment.

Herbert Mace, who has already written many useful volumes dealing with Bees and their allies, has now produced a popular volume, **Modern Bee-keeping** (Publisher, Modern Bee-keeping, Harlow, Essex, 225+xx. pp., 5/- net). This volume is well illustrated and deals with the subject under four headings, namely, General Management of Bees ; Advanced Bee-keeping ; Diseases ; and Flowers, Hive-making,

and Recipes. Among the various chapters are Method of Building Hives, Rearing Queens, Swarming, Marketing Honey, Handling Bees, Bee Lice and Wax Moths, etc.

It will be remembered that the late W. H. Hudson many years ago published a pamphlet on 'Lost British Birds,' in which he drew attention to the more beautiful and striking of our feathered friends which have been exterminated, so far as Britain was concerned, during comparatively recent years. **Among our Banished Birds**, by Bentley Beetham (London : E. Arnold & Co., xi.+227 pp., 10/- net), seems to be on somewhat similar lines, but considerably more in detail, and with us the author deplores the fact that in most cases when a rare bird alights upon our shores nearly everyone who sees it seems bent on its destruction. The species dealt with in the volume are Avocet, Spoonbill, Black-tailed Godwit ; Black Tern, Marismas ; Black-winged Stilt ; Pratincole and the Kentish Plover ; Heron ; Buff-backed Heron ; Egret, each having a chapter to itself in description, and each being illustrated by beautiful photographs.

In the volume on British Ants, a second edition of which was recently published, we admired the extraordinary wealth of information the author was able to get together relating to the Ant family. Still more astonishing is the series of fascinating stories now brought together by **H. St. J. K. Donisthorpe** in his **The Guests of British Ants : Their Habits and Life-histories**, published by the house of G. Routledge & Sons (xxiii.+244 pp., 18/- net). After dealing with the interesting question of Mimicry, Mr. Donisthorpe gives four articles on the Coleoptera, six on Hymenoptera, two on Lepidoptera, five on Diptera, and numerous other orders, including Orthoptera and Neuroptera, Hemiptera, Collembola, and even down to Crustacea and Nematode Worms, there being seventeen chapters in all. These stories, for that is really what the chapters are, are illustrated by sixteen excellent plates and fifty-five diagrams in the text.

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The collection of about 350 geological maps of England and Wales, formed by the late G. W. Lamplugh, F.R.S., has been purchased by the Hull Public Library Committee.

The Danish Geological Survey is organising an international meeting of geologists at Copenhagen from June 25th to 28th, 1928, on the occasion of its fortieth anniversary. Particulars of this meeting can be obtained from the Director, Denmark's Geological Survey, 14 Gammelmont, Copenhagen.

A student who has been carefully perusing a recent Museum Publication sends the following :—' **NOTES ON A NEW AMMONITE FROM SPEETON.**—As the fragment found resembled nothing in particular, it is necessary to create a new genus for it. Hence we have *Whatisitoceras damdifino* (genus and species nov.). Specific description : Coiling sustentaceous, hieroglyphic, pseudomorphic, triplicate. Inner and outer whorls not seen. Venter protuberant, hypochondriac. Ornamentation of dots and ribs forming a sibilant S.O.S. The body chamber for immediate disposal with vacant possession. Suture lines almost as in Charlestontonoceras with a low undulation. *Whatisitoceras damdifino* (Bloggs) includes Sheppard's *Trouseroceras bifurcatus*, and also *Potatoceras woldii* (Stather) non Crofts, as the latter is not tubercular. Local collectors who are not familiar with the whole family of Ammonoids should carefully distinguish it from *Castoroiloceras* (Bean) and Spring-chickenoceras (Young and Bird), which may easily be done by noting that its euomphalic epiglottis is dolicocephalic and its suprarenal capsules are morganatic when young.' We have sent a copy to the local Medical Officer for report.

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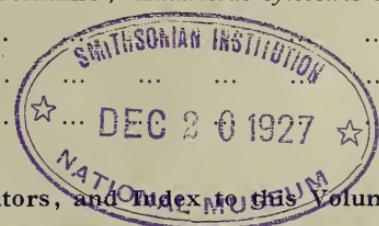
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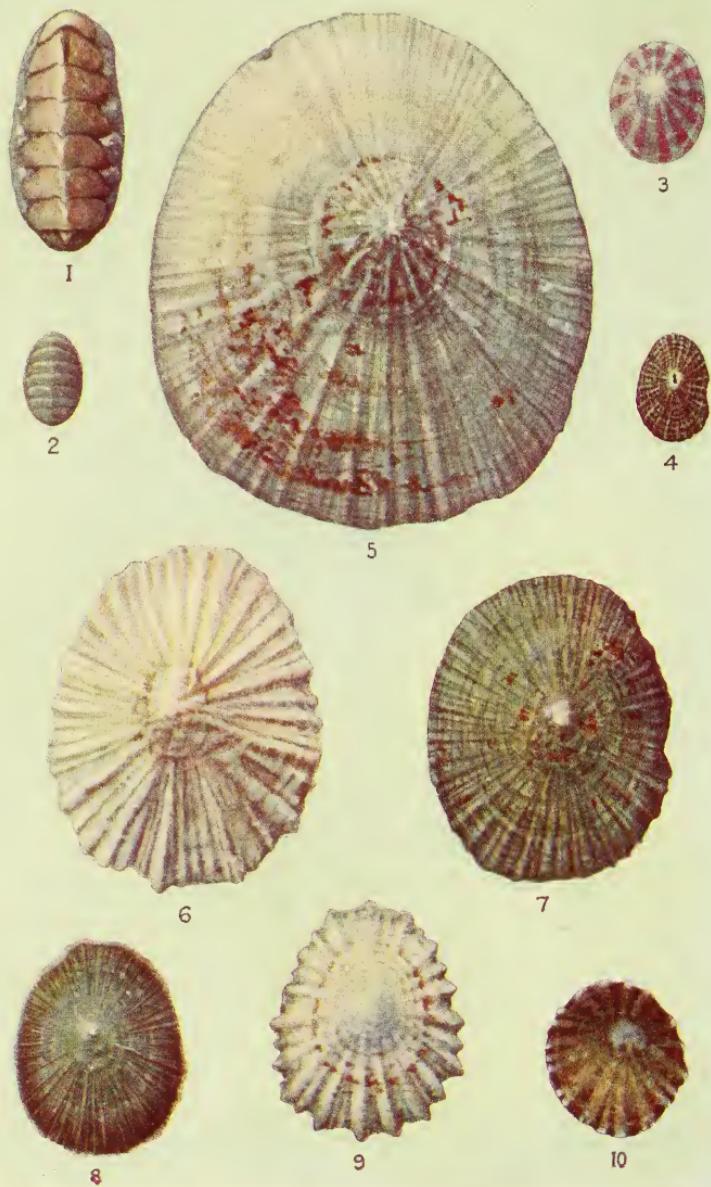
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NOTES AND COMMENTS.

SHELL LIFE.*

The study of the common objects of the sea-shore, as well as of the molluscan contents of our ponds, rivers and fields, seems recently to have had a tremendous revival, judging from the enquiries we have had from time to time; and almost the first question one is asked is 'What book can you recommend which will enable us to identify the specimens collected?' In future this question will be most readily answered, as we shall certainly say 'Shell Life: An Introduction to the British Mollusca,' by Edward Step, an author who needs no recommendation from us. The colouring of nearly two hundred of the principal species of land, freshwater and marine shells is faithfully depicted on well-drawn plates, while there are over four hundred other illustrations in black and white. Probably the illustration given herewith may be taken as a fair sample. (See Plate XI.).

MANUAL OF BRITISH BIRDS.†

A former editor of *The Naturalist*, once engaged at the Museum at Leeds, eventually secured a post at the Natural History Department of the Royal Scottish Museum, Edinburgh, where he quickly climbed to the top of the tree and took sole charge. Following up his editorial work, he connected himself with *The Scottish Naturalist*, which flourished under his care, and he spent considerable time in studying the movements of birds and migration, his holidays being made in different lighthouses for the purpose. On his retirement, naturally a busy man of this character could not remain idle, and consequently at the request of a former editor, he undertook the gigantic task of bringing up to date Howard Saunders' 'Manual of British Birds,' which originally appeared in 1889, a second edition being called for in 1899. After several years' strenuous work, for which he was eminently qualified, this magnificent volume, containing over 800 pages and over 400 illustrations, has made its appearance, and unquestionably will be the standard work of reference relating to the British Avi-fauna for many years to come. The classification and nomenclature adopted, with few exceptions, are those appearing in the List of British Birds compiled by a Committee of the British Ornithological Union. Roughly speaking, each species has two pages devoted to it, but the care with which the author has carried out this work is manifest on almost every page.

* By Edward Step. London: F. Warne & Co., 421 pp., 7/6 net.

† By Howard Saunders. Third edition, revised and enlarged by Dr. W. E. Clarke. London: Gurney & Jackson, viii. + 834 pp., 30/- net.

ROYAL CHARTER FOR THE BRITISH ASSOCIATION.

The Council of the British Association has decided to recommend the General Committee to apply for a Royal Charter for the Association. Members of the British Association from time to time have discussed the desirability of the Association applying for a charter, but the cost has hitherto been a deterrent. Mr. A. A. Campbell Swinton has now offered to bear the cost, and the Council has resolved to recommend the General Committee to accept his offer, and to authorise the President and general officers of the Association to apply for a charter. The possession of a charter would enable the Association to take advantage of a proposal made by Mr. George Buckston Browne to purchase Darwin's house at Downe for the nation, in response to an appeal made by Sir Arthur Keith, as President of the Association at its meeting in Leeds. Mr. Buckston Browne has expressed his desire that the trusteeship of the estate should be vested in the Association, and the Council will recommend the General Committee to accept this offer.

WATER DIVINING.

The Twenty-first Report of the Southport Society of Natural Science is printed from newspaper type, but contains useful abstracts of papers given to the Society. One of these deals with 'Water Divining and Water Finding,' by Edgar Morton, who states that 'The late Sir William Barrett probably gets nearer the truth in suggesting the cause to be an unconscious supernormal perceptive power (telæsthesia), akin to clairvoyance, which may be related to the migratory and homing instinct in birds. From a scientific consideration of the whole of the evidence, the practical conclusions are : That the nature of the phenomenon of divining lends itself to much sorcery ; that the so-called faculty can only apply to shallow surface waters liable to contamination, and that any claim to detect water at great depths is sheer exaggeration, since it does not accord with physiological, biological, evolutionary or geological facts ; that the diviners are ignorant of the scientific laws governing underground water circulation, and that until the phenomenon can be accepted as genuine by the scientific world, divining should not be recognised as a profession.'

GEOLOGICAL PROGRESS.

The Summary of Progress of the Geological Survey of Great Britain for 1926 contains such a wealth of valuable and useful information that we are afraid our anxiety to do it full justice has caused a notice thereon to be delayed. Nowadays the Survey publications are becoming *readable*, with the result that considerably more time is occupied in perusing the

journal than previously was the case. In addition to the district reports for England and Scotland by the various officers responsible, and the sectional reports, and the report of the Museum of Practical Geology, there are no fewer than twelve appendices dealing with 'The Highest Silurian Rocks of the Wenlock District,' by T. Robertson; 'The Upper Limestone Group and "Millstone Grit" of North-east Cumberland,' by F. M. Trotter and S. E. Hollingworth; 'On the Carboniferous Limestone Series of the Northern Part of the Isle of Man,' by B. Smith; 'A "Want"' proved in the Five-foot Seam in the Cowdenbeath District of Fife,' by J. K. Allen; 'The "Penlan Quartzite,"' by E. E. L. Dixon and J. Pringle, with additional note by J. Walton; 'The Barnsley Coal and its variations,' by D. A. Wray; 'The Eastern Boundary of the Concealed Coalfield of Yorkshire and Nottinghamshire,' by G. V. Wilson; 'The Ochil Fault and its Dolerite Intrusion,' by D. Haldane; 'Fossils from the Ironsands on Netley Heath, Surrey,' by C. P. Chatwin; 'The Superficial Deposits in the Clyde Valley at Bonnington, $1\frac{1}{2}$ miles south of Lanark,' by G. Ross; 'A New Species of *Sutcliffia*,' by R. Crookall; and 'The Use of the Torsion Balance in the Investigation of Geological Structure in South-west Persia,' by W. F. P. McLintock and J. Phemister (H.M. Stationery Office, xii.+202 pp., 4/6 net).

MERCURIALIS PERENNIS.

At a recent meeting of the Linnean Society, Lieut S. K. Mukerji read a paper on 'The Biological Relations of *Mercurialis perennis* L.' In this he stated 'A detailed study has been made of plants from various parts of England, together with experimental cultures, and herbarium specimens. A new variety of *M. perennis* was found in Kent. The Far-Eastern *M. leiocarpa* Sieb. and Zucc. is a variety of *M. perennis*. Specimens from China previously regarded as *M. leiocarpa* are identical with *M. perennis*. Some of the so-called varieties of *M. perennis* are merely habitat forms. The specific distinction between *M. corsica* and *M. elliptica* and between *M. ovata* and *M. perennis* is doubtful. The geographical distribution of all the species of the genus has been worked out. The known range of *M. perennis* has been considerably extended, and the discontinuity in distribution of the genus is more apparent than real.'

THE UPNOR ELEPHANT.

In the *Natural History Magazine* for October, published by the British Museum (Natural History), Dr. F. A. Bather describes 'The Upnor Elephant,' and there are photographs showing the method of its exhibition. He states: 'Three or four years before the war a party of Royal Engineers from

Chatham was driving a practice trench through some sandy loam that had filled an old river bed near Upnor, on the banks of the Medway in Kent. The trench was cut unwittingly through the great skeleton, and destroyed a large number of bones and a tusk. Unfortunately the attention of the British Museum was not drawn to the occurrence till 1913, when a local resident, Mr. Sid Turner, picked up some pieces of bone and sent them for identification. One of these was recognised as a carpal or wrist-bone of an unusually large elephant. A reconnaissance confirmed the presence of other bones, but owing to the bad weather, the onset of the war, and other causes, it was not till the summer of 1915 that arrangements could be made to continue the recovery of the skeleton.'

QUEER NESTING PLACES.

We have often heard of quaint places for birds' nests, but the following extract from the Autumn Number of *Bird Notes and News* must be new : 'Nests in broccoli and Brussels sprouts are far outdone in originality by the Blackbird, seemingly with a sense of humour (in spite of its country), which nested in the gardener's cap in an East Lothian garden where all Blackbirds' nests are destroyed ; and by yet another that carefully collected strips of paper which had been strung on to a line as bird-scarers, and twisted them up into nest material. This last is rivalled by a Thrush that made its nest lining of some twenty small toffee papers, smoothed out and neatly arranged in overlapping rows ; this was surely in spring when mud was scarce.'

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Snake -flies in Yorkshire.—The Snake-flies do not seem to be at all common in the county. The only species which I have taken is *Raphidia xanthostigma* Schum., which has occurred on Skipwith Common, in the Wharncliffe Woods, in Ecclesall Woods, and in Ryecroft Glen, near Sheffield.—J. M. BROWN.

Anthriscus sylvestris Hoffm.—A short time ago a youth resident at Bradley, north of Huddersfield, brought a specimen of this plant to me. He remarked that it was locally known as 'Step-Mother's Blessing.' On enquiry, I received confirmation of this quaint local name by youths resident at Crosland Moor, west of Huddersfield. I have failed, however, to obtain any evidence as to why this plant is so named. Local children frequently call this plant 'Mother-Die,' the latter name also applying locally to *Stellaria holostea* L. The first name is not mentioned in Lee's 'Flora of the West Riding.' Is the name 'Step-Mother's Blessing' for this plant known in any other part of our county ?—W. E. L. WATTAM, Newsome.

MOSES OF THE CALDBECK DISTRICT.

JAS. MURRAY.
(*Gretna*).

IN June last, with a friend, I spent a week at Caldbeck, in Cumberland. A feature of the interest of Caldbeck lies in the presence there of limestone rock, through which run a pretty wooded glen and stream. The outlying Lakeland fells also begin within an easy walk of the village. Among the 180 species noted, or gathered, are the following :—

Andreæa was represented by *petrophila* Ehrh., and *rothii* W. and M., on dry rocks, not uncommonly. Seven species of *Polytrichum* were noted, the best being *alpinum* L. and *strictum* Banks. *Ditrichum flexicaule* Hampe was plentiful among grass on Caldbeck Common. **Seligeria doniana* C.M. occurred in very small quantity on a limestone ledge, in a deep gill. *S. recurvata* B. & S. was more plentiful on a block of stone in a wood. On peat near Mosedale, *Dicranella cerviculata* Schp. was in good fruit. *Campylopus schwarzii* Schp. was found on boggy ground on High Pike. *Fissidens pusillus* Wils. grew on a shaded moist stone in a wood. *Grimmia stirtoni* Schp. in almost black tufts on a wall in the village, and *G. doniana* Sm. was not uncommon on rocks on the fells. *Rhacomitrium canescens* Brid. occurred in Roughten Gill and elsewhere. *Tortula papillosa* Wils. was found on the bark of an elder tree, by the roadside leading out of the village to the west. *Barbula* was well represented by *B. rubella* Lindb. and its var. *ruberrima* Ferg. (= *B. ferruginascens* Stirt.), *B. tophacea* Mitt., *B. fallax* Hedw., *B. spadicea* Mitt., *B. cylindrica* Schp. (in good fruit), and others. *Weisia tenuis* C.M. on a block of limestone. *Encalypta vulgaris* Hedw. in fruit on a wall top near Whelpo. *Zygodon mougeotii* B. & S. in rock crevices in the volcanic ash of Roughten Gill, while *Z. viridissimus* R. Brown was not rare on walls on the limestone. *Ulota phyllantha* Brid. had a home on an ash near a stream. *Orthotrichum* was another genus prolific in species. *O. anomalum* var. *saxatile* Milde, *O. cupulatum* Hoffm. and its var. **nudum* Braith., *O. lyellii*, H. & T., *O. affine* Schrad., *O. stramineum* Hornsch., *O. pulchellum* Sm. and *O. diaphanum* Schrad. all occurred in more or less abundance. *Splachnum ampullaceum* L. was sending up its ‘arrows’ on wet ground under Carrock Fell, and *S. sphæricum* L. gave us fully matured capsules at about 1,500 feet on High Pike. *Aulacomnium palustre* Schwæg. was plentiful, and in a bog near Stone Ends was in fine and abundant fruit. *Bretelia arcuata* Schp. was found in small quantity in a waterfall on the western shoulder of High Pike. *Mnium affine* Bland. was represented by its var. **elatum* B. & S., the commonest form

of this species in Cumberland. *M. stellare* Reich. was not uncommon near water. *Neckera pumila* Hedw. on sycamore trunks. *Leucodon sciurooides* Schwæg. occurred by the roadside going to Hesket. **Thuidium philiberti* Limpr. amongst grass by roadside near Caldbeck village. **Cylindrothecium cinninum* Schp. also growing among grass on roadside bank. Perhaps one of our most interesting finds was **Pylaisia polyantha* B. & S., found with young fruit on palings and hawthorn branches in a hedge near Hesket Newmarket, and in a hedge beyond Whelpo. **Brachythecium glareosum* B. & S. plentiful on mossy rocks in a wood. *B. albicans* B. & S. amongst turf under Carrock Fell and on Caldbeck Common. *B. plumosum* B. & S. was common. *B. populeum* B. & S., not always a common moss in Cumberland, was met with on several occasions. *B. salebrosum* var. *palustre* Schp. on the sandy margin of the road over Caldbeck Common. *Eurhynchium* was well represented by *E. pumilum* Schp., *E. tenellum* Milde, *E. teesdalei* Schp., *E. rusciforme* Milde, *E. swartzii* Hobk., and **E. murale* Milde, mostly growing on moist shaded rocks in a limestone gill. *E. piliferum* B. & S. mixed with other mosses. **Plagiothecium deppressum* Dixon grew in flat tufts on limestone rocks, while *P. elegans* Sull. was gathered from a bank along Carrock Beck. Twenty-one species of *Hypnum* were noted. *H. stellatum* Schreb. was found with good fruit in a bog near Stone Ends. Harpidioid Hypna added to the charm of the bogs in which they grew. *H. fluitans* L., *H. exannulatum* Gumb., *H. revolvens* Swartz, *H. commutatum* Hedw., and *H. falcatum* Brid., being found. **H. imponens* Hedw. we were pleased to meet with. It is a pretty moss, growing on bare ground on Caldbeck Common, and in fair quantity. *H. palustre* Huds. occurred in fine fruit on stones in a stream near the village. *H. scorpioides* L. and *H. cordifolium* Hedw. were abundant enough in the bog at Stone Ends. *H. stramineum* Dicks. in the last-named locality and on Caldbeck Common. In shallow ditches we found *H. giganteum* Schp., and *H. vernicosum* Lindb. on the bottom of a dried-up pool. On damp ground on High Pike we met with reddish tufts of *H. sarmentosum* Wahl. Five species of *Hylocomium* were noted, *H. brevirostre* B. & S. being the most uncommon.

Several of the above mosses are, we believe, new county records, and are indicated by an asterisk.

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Acidalia (Sterrhia) laevigata Sc. in Durham is recorded in *The Entomologist* for October.

C. B. Moffat writes on 'The Squirrel' in *The Irish Naturalists' Journal* for September.

The Colliery Guardian has reduced the size of its pages, and we think in the present form this valuable journal is distinctly improved.



Delegates and Members of the Council of the Cardiff Naturalists' Society.

**KEY TO GROUP OF VISITORS AND MEMBERS OF THE COUNCIL
OF THE CARDIFF NATURALISTS' SOCIETY.**

(Taken at entrance of National Museum of Wales, 3rd Nov., 1927).

Front Row (Seated)—Left to Right.

- c* Mr. Dennis H. Morgan, F.C.A. (Hon. Secretary).
- c* Dr. E. P. Perman.
- v* Dr. G. Claridge Druce (Oxford).
- c* Col. A. W. Sheen, C.B.E., M.S.
- v* Prof. W. S. Boulton, D.Sc. (Birmingham).
- c* Mr. R. W. Atkinson, B.Sc. (ex-President).
- v* Mr. R. C. Busser, LL.B. (American Consul at Cardiff).
- c* Mr. T. W. Proger, F.Z.S. (President).
- v* Mr. T. Sheppard, M.Sc. (Hull).
- v* Mrs. Bickerton Pratt (Ponthir) (only surviving daughter of Society's first President in 1867, Mr. Wm. Adams).
- v* Dr. Herbert Bolton (Bristol).
- c* Ven. Archdeacon David Davies, M.A.
- v* Dr. Karl Jordan (Tring).
- c* Mr. H. M. Hallett, F.E.S. (Hon. Librarian).
- c* Mr. Gilbert D. Shepherd, F.C.A. (Hon. Treasurer).

Second Row (Standing)—Left to Right.

- Mrs. Tattersall.
- v* Mrs. Coward (Manchester).
- v* Mr. John Hutchinson (representing Bangor Field Club).
- v* Mr. J. H. Danvers (Southport).
- v* Mrs. Danvers (Southport).
- v* Mrs. Boulton (Birmingham).
- c* Mr. D. Sibbering Jones, J.P.
- c* Mr. S. E. Jenkins.
- c* Mr. H. A. Hyde, M.A.
- v* Miss Ida M. Roper (Bristol).
- v* Mr. James Rafter, M.A. (Bristol).
- v* Miss Pratt (Ponthir).
- v* Mrs. Edmonds (Caerleon).
- c* Dr. R. Pritchard.
- v* Mr. Oswin Charlton, M.A. (Newcastle-on-Tyne).
- Mrs. Sheen,
- Mrs. Grant,
- c* Mr. J. P. Grant, F.R.I.B.A.
- v* Mrs. Busser.

Third Row (Standing)—Left to Right—

-
- c* Mr. A. H. Lee, M.C.
 - v* Mr. W. J. Else (Worcester).
 - c* Mr. James Petree, M.I.N.A.
 - v* Dr. T. Glynn Morris (Liverpool).
 - v* Principal George Knox, F.G.S.
 - Mrs. Hall.
 - c* Dr. F. J. North, F.G.S.
 - c* Mr. G. C. S. Ingram, M.B.O.U.
 - v* Mr. J. H. Jones, J.P. (Gloucester).
 - v* Mr. W. Cullimore, M.A. (Chester).

Fourth Row (Standing)—Left to Right.

- v* Mr. T. A. Coward, M.Sc. (Manchester).
 - c* Mr. Colin Matheson, M.A.
 - c* Mr. Stanley Neale.
 - v* Mr. H. E. Forrest (Shrewsbury).
 - c* Mr. Morley H. Neale.
 - c* Mr. Frank Bird, M.Sc.
 - c* Mr. John Grimes, M.B.E.
 - c* Mr. H. Edgar Salmon, F.Z.S.
 - v* Rev. S. J. Daldry, M.A. (Crewe).
 - c* Mr. T. J. Wakley.
 - Mr. E. W. Pocock.
-

- v* Mr. H. W. Thompson, M.Sc.
- Mr. Ivor P. Jones, A.R.I.B.A.
- v* Mr. A. H. Davison, F.R.S.A.I. (Belfast).
- v* Mr. A. F. Griffith, M.A. (Brighton).

c=Member of Council of C.N.S.

v=Visitor on list of Delegates.

CARDIFF NATURALISTS.

(PLATE XII.).

THE Cardiff Naturalists' Society has recently celebrated its Diamond Jubilee by having a three days' Conference at Cardiff, for which invitations were issued to numerous kindred societies to send delegates, who were entertained in Cardiff.

The Conference was preceded by a Broadcast Talk on Tuesday, November 1st, by the President of the Cardiff Society, Mr. T. W. Proger, F.Z.S., dealing with 'The Society and Its Work.' On Wednesday evening there was a Reception and Dinner at the Whitehall Rooms, Park Hotel, at which there was an extraordinarily enthusiastic attendance of members and visitors. The American Consul of Cardiff (Mr. Ralph C. Busser, LL.B.) and Dr. H. Bolton proposed the health of the Society, which was responded to by the Chairman. Mr. H. E. Salmon followed, proposing the toast of the 'Corresponding Societies,' which was replied to by Mr. T. Sheppard. 'The Guests' were toasted by R. W. Atkinson (Ex-President of the Society), and responded to by the Lord Mayor of Cardiff (Alderman William Grey), Professor W. S. Boulton and Mr. Karl Jordan.

On the following morning the delegates were photographed in front of the National Museum of Wales, and visits were paid to Llandaff Cathedral, Radyr, Castell Coch, Rhubina, Llanishen, and Roath Park. At 4 p.m. Colonel A. W. Sheen gave a lecture on 'The History of the Society,' with lantern slides, and at 7-30 p.m. a Conversazione was held in the National Museum of Wales, where lecturettes were given by the Keepers of Departments. On Friday the excavations of the Roman Station at Caerleon were examined, and later the Cardiff Castle was visited, where the Marquis of Bute provided tea. The Conference concluded by a Reception by the Lord Mayor of Cardiff and Lady Mayoress at the City Hall, followed by a Dance.

Judging from the extensive press reports, all these functions were carried out most successfully, the arrangements having been made by Mr. Dennis H. Morgan, Hon. Secretary of the Cardiff Society.

By the way, the Yorkshire Naturalists' Union, which was at first known as the West Riding Consolidated Naturalists' Society, started its career in 1861, consequently the Union is in its sixty-sixth year.

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The Proceedings and Reports of the Belfast Natural History and Philosophical Society for 1925-6 contain monographs on The Danes; Origin of Surnames; Food Vessel taken from a Cist; and some less Familiar Properties of the Eye. It is not quite clear whether Mr. D. E. Lowry's paper on 'The Danes and Norse' refers to Strangford or Strandford. The printer seems to have used the word very many times, about half being spelt one way and the rest the other.

YORKSHIRE NATURALISTS AT SEDBERGH.

F. A. MASON, F.R.M.S.

THE 336th Meeting was held at Sedbergh during Bank Holiday week-end, July 30th-August 1st. One of the local guide books—and Sedbergh is fortunate in having several very good ones—opens fittingly with the text, 'I will lift up mine eyes unto the hills'; and naturalists in Sedbergh, could sing this line of the Psalm as lustily as any old Sedberghian at the first service of the term, as is the custom at Sedbergh. The extreme corner of North-west Yorkshire in which Sedbergh is so delightfully situated consists of some of our highest Yorkshire hills; from one side of the road rises Howgill Fells to an altitude of 2220 ft., and on the other side Baugh Fell to 2216 ft. It is traditionally related that two men were endeavouring to outdo one another in impressing upon a rustic audience the astonishing extent of their travels. 'I have been to Middlesex, Surrey and Kent,' said the one; said the other 'I've been to Sedbergh, Garsdale and Dent,' and it was difficult to decide which of them was the greater traveller. The latter had evidently peregrinated just that area scheduled for the Bank Holiday excursion, and if he had half the enjoyment and pleasure that fell to our experience in doing it, he did very well.

The Union was fortunate in having enlisted the help of the Rev. A. J. K. Martyn, of Sedbergh School, who, since our member, Mr. Albert Wilson, left the district, does much to keep alive the spirit of natural history investigation in that corner of the county.

On Saturday, the botanists and zoologists, under the guidance of Mr. Martyn, visited Cautley Spout and Craggs; while a small party of geologists, including Mr. J. Oliver and Mr. H. Versey, M.Sc., explored the neighbourhood of Cautley. Despite some inclement weather, which rendered work on the fells rather difficult, a thoroughly enjoyable day was experienced.

On Saturday evening, through the courtesy of the Headmaster of Sedbergh School, members attended a conversazione held in the school library, where, once again, Mr. Martyn admirably filled the role of guide, philosopher and friend. The library itself, the museum, and Mr. Martyn's racy outline of the history of the School, its headmasters and famous old Sedberghians, occupied a very pleasant evening.

On Monday, a party motoring out to Danny Bridge, worked by the line of the Dent Fault to Dovecote Caves and Hebblethwaite Gill. The weather was more favourable, and many interesting observations were made by all sections, as will be noted from the reports which follow.

Other excursions during the week-end were made by small parties, and the district between Garsdale on the east and the Lancashire border to the west of Sedbergh was fairly well covered. Those archaeologically inclined found in the ancient Parish Church of St. Andrew, which shows work of every period from Norman times to the present, much of great interest in both its interior and exterior. Members also availed themselves of the opportunity of inspecting the school buildings under Mr. Martyn's guidance. Bearing no resemblance to its former self, as founded by Roger Lupton, of Howgill (who became Provost of Eton), about 1525, the school now consists of a series of handsome buildings, everyone of them, including the chapel and unique war memorial, containing some mark of the munificence with which old Sedberghians have remembered their *Alma Mater*.

A General Meeting was held in the library on Monday evening, Mr. H. B. Booth occupying the chair. After hearing brief reports on the work of the sections during the week-end, very hearty votes of thanks were unanimously accorded to those who had assisted in making the meeting a success. These included the local secretary (Mr. J. Hartshorn),

the Headmaster of Sedbergh School, the Rev. A. J. K. Martyn, Messrs. E. D. Evans and J. Oliver; and Mr. R. Burra, who had kindly invited members to visit his estate at Gate.

The Hon. Sec. acknowledged his indebtedness to Mr. Albert Wilson in the compilation of the Circular.

GEOLOGY (H. C. Versey, M.Sc.) :—The chief attention of the geologists was drawn to the area east of Sedbergh, where the line of the Dent Fault was traced and its effect noticed. In the classical section of Taithes Gill, overturning of the Carboniferous Limestone points to the compressive forces concerned in the faulting. This overturning, often accompanied by fault-breccia, was seen all the way from the Rawthey section in the north to Barbisdale in the south. The Dent Fault must be considered along this line as definitely reversed, and is thus brought into line with all the others which make up the Northumbrian Fault Block. All these faults have an outward throw and separated, in late Carboniferous and Permian times, an inside uplifted area from an outer relatively depressed area.

The thick basement beds of the Carboniferous seem to occur on the outside of this block, their eastern boundary often being the large fault itself, while their western boundary is either an unconformity or a fault of smaller throw. This distribution seems to indicate the existence of an area of uplift in early Carboniferous times or in Devonian times, roughly coincident with the one mentioned above.

On Saturday, the Ashgillian and Caradocian rocks round Cautley were investigated, and the characteristic trilobites, etc., were collected. No new observations were made in this area other than the finding of a small unmapped intrusion of lamprophyre.

FLOWERING PLANTS (Miss D. Hilary, B.Sc.) :—The country all round Sedbergh proved to be very rich in flowering plants, and a great many species of more than ordinary interest were found. As Mr. Albert Wilson says in the circular, 'The district has an interesting flora of a decidedly montane character, and such plants as *Anemone nemorosa* and *Geranium sylvaticum*, which usually occur in woods or on damp rocky banks, are frequent in open meadows. The latter is a special feature of the district, and a great ornament in June before the grass is cut.' This was particularly noticeable in Garsdale where some of the meadows were still standing, and on the banks of the River Clough the dominant features were the masses of *Trollius europaeus* and *Cnicus heterophyllus*.

The excursion to Cautley was perhaps the most interesting of all. There the boggy ground of the lower slopes yielded quantities of bog plants, including *Drosera rotundifolia* and *Pinguicula vulgaris*—insectivorous plants eking out their scanty supplies of available nitrogenous food by the capture and digestion of insects—*Parnassia palustris*, *Triglochin palustre*, *Epilobium palustre*, *Pedicularis palustris*, *Mimulus luteus* and *Scirpus setaceus*. Higher up were found the Mountain Willow Herb (*E. alsinefolium*), two Saxifrages (*S. hypnoides* and *S. stellaris*), *Sedum roseum* and masses of *Thalictrum minus*, while one of the most interesting features was the quantity of *Alchemilla alpina*, this being probably its only Yorkshire station. Other plants which were sought in vain were *Pyrola secunda*, which has been recorded growing at the top of one of the little waterfalls of the Spout, *Saxifraga azoides*, which Mr. Wilson says occurs in most of the gills, but especially on the rocks in Ashbeck Gill, half a mile above Gill Farm, and *Salix herbacea* which grows 2000 ft. high at Cautley, and which was found later on Whernside. Monday's excursion from Danny Bridge to Dovecote Caves and Hebblethwaite Gill also provided an interesting flora. *Carlina vulgaris*, *Hypericum humifusum* and *Arenaria verna* occurred near Danny Bridge, while on boggy ground on the moor above Dovecote Caves were found *Vaccinium oxycoccus* and *Anagallis tenella*. Other less common plants

found during the week-end were *Jasione montana*, *Habenaria bifolia* and *H. conopsea* (in Hebblethwaite Gill), *Polygonum multiflorum*, *Narthecium ossifragum* (particularly fine specimens growing abundantly just over the border, but found later near Sedbergh on the road to Dent), and, perhaps the best find of all *Circæa alpina*, found near the Rawthey valley.

Mr. J. W. Brown sends the following list of carices :—

* <i>Carex sylvatica</i> .	* <i>Carex pallescens</i> .
† „ <i>flava</i> .	„ <i>panicea</i> .
„ <i>caryophyllea</i> .	„ <i>goodenowii</i> .
† „ <i>pilulifera</i> .	„ <i>leporina</i> .
„ <i>flaccia</i> .	† „ <i>stellutata</i> .

PTERIDOPHYTES :—The rich variety and abundant growth of ferns was a striking feature of the excursion. The luxuriant masses of *Cryptogramme crispa* (Parsley Fern) on the slopes of Cautley will not soon be forgotten, and here, too, was seen the delicate little filmy fern (*Hymenophyllum peltatum*) growing profusely of the sides on the Spout, as well as three species of *Asplenium*—*A. trichomanes*, *A. viride*, *A. adiantum nigrum*. Hebblethwaite Gill was also very rich in ferns, *Phegopteris dryopteris* and *P. polypodioides* being abundant. *Cystopteris fragilis*, *Blechnum spicant*, *Polystichum aculeatum* and *Lastrea oreopteris* were also found there, while *Asplenium ruta-muraria* and *Polypodium vulgare* were everywhere on the walls.

On the slopes of Cautley grows the only British *Selaginella*, *S. selaginoides*, and higher up three out of the five British Lycopods were found abundantly, very often all growing together and all in fruit, viz., *L. clavatum*, *L. selago*, and *L. alpinum*.

THE BRYOPHYNES (Miss D. Hilary, B.Sc.) :—The Sedbergh district is rich in both mosses and liverworts, and quite a number of good plants were found. On the higher rock faces at Cautley *Andreæa alpina* was plentiful, and *Seligeria recurvata* covered some of the wet rocks near the Spout. *Blindia acuta*, *Oligotrichum hercynicum*, *Fissidens osmundoides*, *Plagiobryum zierii*, *Weisia curvirostris* var. *commutata*, *Ptychomitrium polyphyllum*, *Hedwigia ciliata*, and *Diphyscium foliosum* were all found in the Cautley district, the only disappointment being the fruitless search for *Edipodium griffithianum*, which has been found there previously. Hebblethwaite Gill also yielded a good list of interesting plants, perhaps the most striking being *Microlejeunea ulicina*, which was growing in great profusion on alder, oak, hazel, elm, and sycamore in the lower part of the gill. *Cololejeunea calcarea* and *Lejeunea cavifolia* were also fairly abundant. One plant which one would expect to be common on the rocks in the stream and of which only one small gathering was made was *Rhacomitrium aciculare*.

The rarest plant found during the excursion was undoubtedly *Anæctangium compactum*, large masses of which, fruiting luxuriously, were found by Mr. Cheetham in Uldale in practically the same spot as he found it twenty years ago. The following is the list of plants found :

MOSSES.

<i>Andreæa petrophila</i> .	<i>Diphyscium foliosum</i> .
„ <i>alpina</i> .	var. <i>acutifolium</i> .
<i>Tetraphis pellucida</i> .	<i>Ditrichum homomallum</i> .
<i>Catherinea undulata</i> .	<i>Seligeria recurvata</i> .
<i>Oligotrichum hercynicum</i> .	<i>Ceratodon purpureus</i> .
<i>Polytrichum urnigerum</i> .	<i>Dichodontium pellucidum</i> .
„ <i>piliferum</i> .	„ <i>flavescens</i> .
„ <i>juniperinum</i> .	<i>Dicranella heteromalla</i> .
„ <i>formosum</i> .	„ <i>secunda</i> .

* Hebblethwaite Gill.

† Common.

<i>Dicranella squarrosa.</i>	<i>Breutelia arcuata.</i>
<i>Blindia acuta.</i>	<i>Webera nutans.</i>
<i>Dicranum scoparium.</i>	<i>„ albicans.</i>
„ <i>majus.</i>	<i>Plagiobryum zierii.</i>
<i>Leucobryum glaucum.</i>	<i>Bryum pallens.</i>
<i>Fissidens viridulus.</i>	<i>Mnium undulatum.</i>
„ <i>osmundoides.</i>	„ <i>hornum.</i>
„ <i>adiantoides.</i>	„ <i>punctatum.</i>
„ <i>decipiens.</i>	<i>Fontinalis antipyretica.</i>
„ <i>taxifolius.</i>	<i>Neckera crispa.</i>
<i>Grimmia apocarpa.</i>	„ <i>complanata.</i>
„ <i>doriana.</i>	<i>Porotrichum alopecurum.</i>
<i>Rhacomitrium aciculare.</i>	<i>Thuidium tamariscinum.</i>
„ <i>heterostichum.</i>	<i>Climacium dendroides.</i>
<i>Ptychomitrium polypodium.</i>	<i>Brachythecium rivulare.</i>
<i>Hedwigia ciliata.</i>	„ <i>plumosum.</i>
<i>Tortula muralis.</i>	„ <i>purum.</i>
„ <i>subulata.</i>	<i>Eurychium praelongum.</i>
<i>Barbula rubella</i> var. <i>dentata.</i>	„ <i>rusciforme.</i>
„ <i>spadicea.</i>	<i>Plagiothecium undulatum.</i>
„ <i>convoluta.</i>	„ <i>denticulatum.</i>
<i>Weisia rupestris.</i>	<i>Amblystegium serpens.</i>
„ <i>curvirostris</i> var. <i>commutata.</i>	„ <i>filicinum.</i>
<i>Trichostomum crispulum.</i>	<i>Hypnum commutatum.</i>
„ <i>tortuosum.</i>	„ <i>falcatum.</i>
<i>Encalypta streptocarpa.</i>	„ <i>uncinatum.</i>
<i>Anectangium compactum.</i>	„ <i>cupressiforme.</i>
<i>Ulotrichum bruchii.</i>	„ <i>molluscum.</i>
„ <i>crispa.</i>	„ <i>palustre.</i>
<i>Orthothecium intricatum.</i>	„ <i>cuspidatum.</i>
<i>Orthotrichum anomalum</i> var. <i>saxatile.</i>	„ <i>schreberi.</i>
<i>Funaria hygrometrica.</i>	<i>Hylocomium splendens.</i>
<i>Bartramia ithyphylla.</i>	„ <i>squarrosum.</i>
„ <i>pomiformis.</i>	„ <i>loreum.</i>
<i>Philonotis fontana.</i>	„ <i>triquidatum.</i>

LIVERWORTS.

<i>Conocephalum conicum.</i>	<i>Calyptogeia trichomanis.</i>
<i>Preissia quadrata.</i>	„ <i>arguta.</i>
<i>Marchantia polymorpha.</i>	<i>Lepidozia trichoclados.</i>
<i>Aneura pinguis.</i>	„ <i>reptans.</i>
<i>Metzgeria furcata.</i>	<i>Diplophyllum albicans.</i>
„ <i>pubescens.</i>	<i>Scapania aspera.</i>
<i>Pellia epiphylla.</i>	<i>Madotheca laevigata.</i>
<i>Alicularia scalaris.</i>	<i>Cololejeunea calcarea.</i>
<i>Lophozia floerkii.</i>	<i>Microlejeunea ulicina.</i>
<i>Plagiochila asplenoides.</i>	<i>Lejeunea cavifolia.</i>
var. <i>major.</i>	<i>Frullania tamarisci.</i>
<i>Lophocolea cuspidata.</i>	„ <i>dilatata.</i>
<i>Cephalozia bicuspidata.</i>	

VERTEBRATE ZOOLOGY (H. B. Booth) :—Although rather late in the year the ornithologists present had not a bad time. Two Peregrine Falcons were seen, and we had the extreme satisfaction of learning that at last the local nesting pair had been allowed to rear their brood. In part proof of this we were shown photographs in the Sedbergh School album of the four eggs in the eyrie, which instead of taking them, is a good sign of the times.

The Meadow Pipit was the chief bird of the moorside, with an occasional Wheatear or Whinchat, and a lagged Common Sandpiper

on the mountain stream. On the moors a few Red Grouse were seen, but we greatly missed the Curlews, Golden Plovers, Dunlins, Redshanks, etc., which had left for the shore and salt marshes. Several Ravens were seen, and at one time six (probably a family party) flew over almost together. (This was when most of the members were 'corkscrewing' their way through the Dovecote Caves). The Ring Dove and the Mistle Thrush appeared to be comparatively common. The chief desideratum of the ornithologists was to find any signs of the presence of the Red-backed Shrike, which used to nest here annually. The photograph of its nest and eggs, by Mr. Riley Fortune, in 'The Birds of Yorkshire,' was taken near to Danny Bridge, near Sedbergh, about 25 years ago. Unfortunately our investigations were unsuccessful, and Mr. Alfred Braithwaite (a good local authority), informed me that he had not known a nest of the Red-backed Shrike in the neighbourhood since a thick hedge was cut down over twenty years ago, at Ing Mire, near to the Sedbergh railway station. Through the courtesy of the Headmaster of the Sedbergh School, and particularly through the willing kindness of the school's chaplain (the Rev. A. J. K. Martyn), the party had the privilege of visiting the school museum. The chief local birds therein were two fine Common Buzzards, both of which had been obtained in Middleton Wood (although only a few miles from Sedbergh, is just over the Westmorland border). (On one of the cases is a note that the Common Buzzard frequented this wood up to the year 1914.) In another case was a very fine adult Raven, shot at Black Force, which is just within Yorkshire.* Mr. A. Braithwaite showed me a fine clutch of eleven eggs of the Common Quail, which had been taken near Sedbergh a few years ago. The nest was in a meadow, and fortunately the mowing machine passed over the nest without breaking any of the eggs.

In sections other than ornithology little was observed, excepting that small trout inhabited the stream right up to the foot of the waterfalls in Cautley Spout.

MOLLUSCA (Greevz Fysher) :—A good number of *Helix aspersa* were found among nettles near a garden on the road to Dent. With them was a pair reciprocally united in the hermaphrodite embrace. In the flesh of each was deeply embedded the shelly 'love dart' of the other partner—a very interesting but not an uncommon occurrence. Mr. Taylor, in the Monograph of British Non-Marine Mollusca, Vol. I., p. 366, states that 'old writers considered it (the dart) to be a missile hurled by one snail at another, and this mode is still spoken of by some modern writers as though the dart was launched through the air,' but the evidence for a dart ever being shot to a distance is not conclusive.

In addition to the foregoing, Mr. John W. Taylor has identified the following :—*Helix aspersa*, *Pyramidula rotundata*, *P. rupestris*, *Hygromia hispida*, *Limax arborum*, *Milax sowerbyi*, *Arion subfuscus* and var. *cinerreo fusca*, *A. ater* greenish-grey var. juv., *Hygromia striolata*, *Clausilia bidentata*, *Pupa cylindracea*, *Hyalinia cellaria*.

In tributary of Cautley Beck, Sedbergh : *Ancylus fluviatilis* and var. *albida*, *Limnaea peregra* and *L. truncatula*, *Pyramidula rotundata*, *Succinea elegans*.

ENTOMOLOGY (J. M. Brown, B.Sc.). **APTERYGOTA** :—The conditions prevented any serious search being made for these inconspicuous creatures, and only a few species were taken, the most interesting being *Agrenia bidenticulata* Tullb., found in plenty on the stones in Cautley Beck. This species was last taken in the Little Don near Penistone (*The Naturalist*, 1923, p. 344), it being restricted to upland streams. Other species taken were :—

* In the same museum there is a rare, almost wholly white Otter (adult), but, unfortunately, without any data.

<i>Achorutes armatus</i> Nic.	<i>Tomocerus minor</i> Lubb.
<i>Neanura muscorum</i> Templ.	<i>Orchesella cincta</i> L. and var. <i>vaga</i>
<i>Isotomurus palustris</i> Müll.	L.
<i>Entomobrya nivalis</i> L.	<i>Dicyrtomina minuta</i> O. Fabr. and
,, <i>nicoleti</i> Lubb.	var. <i>ornata</i> L.
<i>Lepidocyrtus lanuginosus</i> Gmel.	<i>Campodea gardneri</i> Bagn.

ORTHOPTERA :—Grasshoppers were plentiful in most places visited, and the few taken belonged to the species *Tetrix bipunctatus* L. and *Stenobothrus viridulus* L.

PSOCOPTERA :—A number of specimens of this restricted order were obtained, chiefly by general beating at various points on the routes taken. These included :—

<i>Amphigerontia bifasciatus</i> Latr.	<i>Peripsocus phaeopterus</i> Steph.
<i>Stenopsocus immaculatus</i> Steph.	<i>Elipsocus westwoodii</i> McLach.
<i>Graphopsocus cruciatus</i> L.	,, <i>hyalinus</i> Steph.
<i>Cæcilius obsoletus</i> Steph.	

HEMIPTERA :—More attention was paid to this order as we have very few previous records for the district, but as a great part of the ground covered was not that specially favoured by the Hemiptera, and as the members of this order seem to be particularly scarce this season, the number of species obtained was smaller than was to be expected. One interesting species new to the county was taken. *Heterocordylus genistæ* was swept from its usual food plant, *Genista tinctoria*, first on the Westmorland side, and later in the week at Ingleton.

HETEROPTERA.

<i>Pentatoma (Tropicoris) rufipes</i> L.	Ingleton.
<i>Nabis limbatus</i> Dahlb.	Ingleton.
<i>Anthocoris confusus</i> Reut.	Common.
<i>Pithanus märkeli</i> H.S.	Generally distributed.
<i>Calocoris sexguttatus</i> F.	Plentiful.
<i>Lygus pabulinus</i> L.	Generally distributed.
<i>L. contaminatus</i> Fall.	Hebblethwaite Gill and Ingleton.
<i>Plesiocoris rugicollis</i> Fall.	Dent.
<i>Trigonotylus ruficornis</i> Geoff.	Generally distributed.
<i>Miris ferrugatus</i> Fall.	Generally distributed.
<i>Monalocoris filicis</i> L.	Common on Bracken.
<i>Bryocoris pteridis</i> Fall.	Hebblethwaite Gill and Ingleton.
<i>Dicyphus stachydis</i> Reut.	Common.
<i>Blepharidopterus angulatus</i> Fall.	Ingleton.
<i>Mecomma ambulans</i> Fall.	Common.
<i>Orthotylus marginalis</i> Reut.	Hebblethwaite Gill.
,, <i>ericetorum</i> Fall.	Under heather above the Dovecote Caves.
<i>Heterocordylus genistæ</i> Scop.	Ingleton Beck.
<i>Phylus coryli</i> var. <i>avellanae</i> L.	Generally distributed on hazel.
<i>P. melanocephalus</i> L.	Hebblethwaite Gill.
<i>Psallus varians</i> H. S.	Ingleton.
,, <i>roseus</i> Fabr.	Hebblethwaite Gill.
<i>Plagiognathus chrysanthemi</i> Wolft.	Common.
,, <i>arbustorum</i> F.	Common.
<i>Asciodesma obsoletum</i> Fieb.	Danny Bridge.

HOMOPTERA.

<i>Philænus spumarius</i> L.	Common.
f. <i>leucophthalmus</i> L.	Ingleton.
f. <i>populi</i> Fab.	Common.
,, <i>lineatus</i> L.	Widely distributed.
<i>Eucanthus interruptus</i> L.	Hebblethwaite Gill and Ingleton.
<i>Oncopsis rufusculus</i> Fieb.	Hebblethwaite Gill.
,, <i>alni</i> Sch.	Hebblethwaite Gill.

- Idiocerus lituratus* Fall. Ingleton.
I. confusus Flor. Ingleton.
Acocephalus bifasciatus L. Moor above Dovecote Caves.
Athysanus obsoletus Kbm. Common.
Deltocephalus distinguendus Flor. Generally distributed.
 .. *punctum* Flor. Cautley Beck.
 .. *pulicaris* Fall. Common.
Thamnotettix prasinus Fall. Ingleton.
Cicadula septemnotata Fab. Common.
Dicraneura flavipennis Zett. Cautley Beck.
Eupteryx stachydearum Hdy. Ingleton.
E. auratus L. Hebblethwaite Gill.
 .. *atropunctatus* Goeze. Hebblethwaite Gill.
 .. *signatipennis* Boh. Hebblethwaite Gill.
Typhlocyba ulmi L. Common.
Typhlocyba geometrica Sch. Ingleton.
Zygina alneti Dahl. Hebblethwaite Gill and Ingleton.
Cixius cunicularius L. Ingleton.
 .. *nervosus* L. Ingleton.
Conomelus limbatus Fab. Hebblethwaite Gill and Cautley Beck.
Psyllopsis fraxinicola Forst. Hebblethwaite Gill and Dent.
Psylla alni L. Common.
 .. *peregrina* Forst. Common.
 .. *buxi* L. Ingleton.

In addition, a number of Heteroptera were obtained near Middleton, on the Westmorland side of the boundary.

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| <i>Stignocoris pedestris</i> Fall. | <i>Idiocerus lituratus</i> Dall. |
| <i>Nabis limbatus</i> Dahlb. | .. <i>confusus</i> Flor. |
| <i>Calocoris sexguttatus</i> F. | <i>Deltocephalus distinguendus</i> Flor. |
| <i>Lygus pabulinus</i> L. | .. <i>pascuellus</i> Fall. |
| <i>Plesiocoris rugicollis</i> Fall. | .. <i>punctum</i> Flor. |
| <i>Trigonotylus ruficornis</i> Geoff. | .. <i>pulicaris</i> Fall. |
| <i>Miris ferrugatus</i> Fall. | <i>Albula albostriella</i> Fall. |
| <i>Monalocoris flicis</i> L. | <i>Dicraneura similis</i> Edw. |
| <i>Heterocordylus genistae</i> Scop. | <i>Eupteryx auratus</i> L. |
| <i>Psallus roseus</i> Fabr. | .. <i>atropunctatus</i> Goeze. |
| <i>Plagiognathus arbustorum</i> F. | .. <i>signatipennis</i> Boh. |
| .. <i>chrysanthemi</i> Wolff. | .. <i>pusillus</i> Fall. |
| <i>Aphrophora alni</i> Fall. | .. <i>concinna</i> Germ. |
| <i>Philenous spumarius</i> L. | <i>Typhlocyba tenurima</i> H. S. |
| <i>Eucaanthus interruptus</i> L. | <i>Zygina alneti</i> Dahl. |
| <i>Oncopsis alni</i> Sch. | <i>Cixius nervosus</i> L. |
| .. <i>rufusculus</i> Fieb. | .. <i>cunicularius</i> L. |
| <i>Macropsis impura</i> Boh. | <i>Psylla peregrina</i> Forst. |
| <i>Athysanus obsoletus</i> Kbm. | <i>Trioza urticae</i> L. |

The most striking feature of the Hemiptera lists is the surprising absence of many usually common and abundant species.

COLEOPTERA :—No attempt was made to deal with the beetles fully, as these have been listed for the district on previous visits, but among those taken on the present occasion were :—

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|-----------------------------------|-----------------------------------|
| <i>Carabus violaceus</i> L. | <i>Athous hirtus</i> Hbst. |
| <i>Cliniua fossor</i> L. | <i>Malthinus flaviolus</i> Payk. |
| <i>Agonum parumpunctatum</i> F. | <i>Malthodes marginatus</i> Latr. |
| <i>Stenus similis</i> Hbst. | .. <i>minimus</i> L. |
| <i>Geotrupes sylvaticus</i> Panz. | <i>Lochmaea suturalis</i> Thoms. |
| <i>Phyllobius oblongus</i> L. | |

LEPIDOPTERA (R. Butterfield) :—The following species were noted :—

<i>Vanessa urticæ.</i>	<i>Eupithecia pulchellata.</i>
<i>Satyrus janira.</i>	<i>Melanippe montanata.</i>
<i>Chortobius pamphilus.</i>	<i>Emmelesia minorata.</i>
<i>Nudaria mundana.</i>	<i>Cidaria comitata.</i>
<i>Venusia cambrica.</i>	<i>Boarmia rhomboidaria.</i>
<i>Larentia olivata.</i>	<i>Anarta myrtilli.</i>
,, <i>cæsiata.</i>	<i>Stilbia anomala.</i>
<i>Acidalia aversata.</i>	<i>Aphomia sociella.</i>

Larvæ of the Small Ermine Moth were seen on the bird cherry, at Hebblethwaite Gill, and of *S. carpini* on the moor adjacent.

HYMENOPTERA (R. Butterfield) :—The following species were taken :—

<i>Myrmica rubra</i> vars. <i>sulcinodis</i> and <i>scrabrinodis.</i>	<i>Bombus terrestris.</i>
<i>Formica fusca.</i>	<i>Vespa norvegica.</i>
<i>Lasius flavus.</i>	„ <i>sylvestris.</i>
<i>Bombus venustus.</i>	„ <i>rufa.</i>
„ <i>agrorum.</i>	<i>Andrena nana.</i>
„ <i>hortorum.</i>	<i>Nomada fabriciana.</i>
„ <i>distinguendus.</i>	„ <i>ochrostoma.</i>
„ <i>pratorum.</i>	<i>Halictus albipes.</i>
	<i>Psithyrus vestalis.</i>

The abundance of a small Sawfly larvæ curled round the upper parts of grass blades at Cautley Beck and elsewhere attracted attention.

PLANT GALLS (J. M. Brown) :—Several members of the Galls' Committee were present who took what opportunity offered in looking out for galled plants, but over a considerable portion of the route close search, involving much delay, would have been necessary to do the subject justice. The subjoined list, therefore, represents the most conspicuous cases only. Galls due to fungi are included in the list of these latter given in Mr. Mason's report.

Plant	Gall Maker.
Male Fern	galled by <i>Anthomyia signata</i> Br. Ingleton.
Yew	„ „ <i>Oligotrophus taxi</i> Inch. Sedbergh.
Willow sp.	„ „ „ <i>capreae</i> Win.
„	„ „ „ <i>Pontania pedunculi</i> Hart.
Alder	„ „ „ <i>Eriophyes laevis</i> Nal.
Hazel	„ „ „ <i>avellanae</i> Nal.
Oak	„ „ „ <i>Dryophanta verrucosa</i> f. <i>divisa</i> Hart.
„	„ „ „ <i>Neuroterus baccarum</i> f. <i>lenticularis</i> Oliv.
„	„ „ „ <i>Andricus pilosus</i> f. <i>fecundator</i> Hart.
„	„ „ „ <i>curvator</i> Hart.
„	„ „ „ <i>Dryophanta agama</i> Hart. Ingleton.
„	„ „ „ <i>Macrodiplosis dryobia</i> Low. Ingleton.
Elm	„ „ „ <i>Tetraneura ulmi</i> De G.
Nettle	„ „ „ <i>Perrisia urticae</i> Perris.
Red Campion	„ „ „ <i>Contarinia steini</i> Karsch.
Mountain Ash	„ „ „ <i>Aphis sorbi</i> Kalt.
Dog Rose	„ „ „ <i>Rhodites rosæ</i> L.
Blackthorn	„ „ „ <i>Aphis padi</i> L.
Meadow Sweet	„ „ „ <i>Perrisia ulmariae</i> Bremi.
Vetch	„ „ „ <i>viciae</i> Kief.
Box	„ „ „ <i>Psylla buxi</i> L.
Sycamore	„ „ „ <i>Phyllocoptes acericola</i> Nal.
„	„ „ „ <i>Eriophyes macrochelus</i> Nal.
Figwort	„ „ „ <i>Mecinus beccabungæ</i> L.
Ash	„ „ „ <i>Psyllopsis fraxini</i> L.
„	„ „ „ <i>Perrisia fraxini</i> Kief.
Guelder Rose	„ „ „ <i>Aphis viburni</i> Scop.

DIPTERA (Chris. A. Cheetham) :—The diptera which appear in the

following list are mostly found in shady places, and are not very dependent on sunshine, in fact there were few flowers for syrphids and the like. Two or three plants of *Angelica* in Hebblethwaite Gill gave the sun-loving species that appear, the most abundant being *Ischyrosyrphus glaucius*. Some interesting flies were obtained in spite of the weather conditions, among the dolichopods, *Dolichopus laticola* and *Sympycnus spiculatus* were the best; the mycetophilid, *Anatella incisurata*, and the anthomyiid *Cenosia pygmaea* were additions to the list; but the prizes which stand out and make the excursion a success from the dipterist's point of view were caught on the higher reaches of the Rawthey, near Uldale.

In an open cave a good many limnobids were noticed ovipositing on masses of damp moss (*Hypnum commutatum*), they were very frail and made little or no effort to escape; their abdomens were pink in colour, and they had clear wings which seemed very delicate and ready to collapse at any moment. These are *Orimarga virgo* Ztt. Further upstream, in some old quarry workings, others were caught which were much darker coloured with none of the pink shade and much less frail, but with the same venation and hypopygium. Another smaller insect in this same place, again ovipositing on moss, was *Dicranomyia aquosa* Verr. Both these limnobids are found in more northerly countries, and are welcome additions to our list.

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| <i>Mycetophila vittipes</i> Ztt. | <i>Tipula paludosa</i> Mg. |
| „ <i>ornata</i> Stph (<i>rufescens</i>). | „ <i>oleracea</i> L. |
| <i>Anatella incisurata</i> Edw. | <i>Leptis lineola</i> F. |
| <i>Macrocerca lutea</i> Mg. | „ <i>nigriventris</i> Lw. |
| „ <i>phalerata</i> Mg. | <i>Chrysopilus cristatus</i> F. |
| <i>Boletophila cinerea</i> Mg. | <i>Hybos culiciformis</i> F. |
| <i>Diadocidia ferruginosa</i> Mg. | „ <i>femoratus</i> Mull. |
| <i>Simulium latipes</i> Mg. | <i>Hilara litorea</i> Fln. |
| <i>Palpomyia praestuta</i> Lw. | „ <i>matrona</i> Hall. |
| <i>Theobaldia alaskensis</i> Ludlow | „ <i>quadrivittata</i> Mg. |
| (<i>arctica</i> Edw.). | „ (<i>Oreogeton</i>) <i>flavipes</i> Mg. |
| <i>Limnobia quadrinotata</i> Mg. | <i>Ocydromia glabricula</i> Mg. |
| <i>Dicranomyia lutea</i> Mg. | <i>Hydrodromia (Clinocera) wesmaelii</i> |
| „ <i>chorea</i> Mg. | Mcq. |
| „ <i>aquosa</i> Verr. | <i>Chelifera (Hemerodromia) praetoria</i> Fln. |
| „ <i>didyma</i> Mg. | <i>Tachydromia pectoralis</i> Fln. |
| „ <i>dumetorum</i> Mg. | <i>Scilopus (Psilopus) platypterus</i> F. |
| <i>Rhiphidia maculata</i> Mg. | <i>Dolichopus laticola</i> Verr. |
| <i>Orimarga virgo</i> Ztt. | „ <i>discifer</i> Stan. |
| <i>Molophilus armatus</i> de Meij. | „ <i>plumipes</i> Scop. |
| „ <i>cinereifrons</i> de Meij. | „ <i>popularis</i> Wild. |
| „ <i>medius</i> de Meig. | <i>Hercostomus germanus</i> W. |
| „ <i>bifidus</i> Tonn. | <i>Hypophyllus obscurellus</i> Fln. |
| <i>Gonomyia incisurata</i> Tonn. (den- | <i>Gymnopternus aevosus</i> Fln. |
| tata?). | <i>Chrysotus gramineus</i> Fln. |
| <i>Lipsothrix remota</i> Wlk. (<i>errans</i>). | <i>Argyra argentina</i> Mg. |
| <i>Limnophila fulvonervosa</i> Schum. | <i>Lianculus virens</i> Scop. |
| (<i>lineolella</i> Verr.). | <i>Sympycnus cirrhipes</i> Wlk. |
| <i>Tricyphona (Amalopsis) littoralis</i> | „ <i>spiculatus</i> Gerst. |
| Mg. | <i>Lonchoptera lutea</i> Panz. |
| <i>Tricyphona (Amalopsis) occulta</i> Mg. | <i>Chrysogaster solstitialis</i> Fln. |
| „ <i>straminea</i> Mg. | <i>Platychirus peltatus</i> Mg. |
| <i>Trichocera regelationis</i> L. | <i>Melanostoma mellinum</i> L. |
| <i>Ephelia apicata</i> Lw. | „ <i>scalare</i> F. |
| <i>Pachyrrhina crinicauda</i> Riedel. | <i>Ischyrosyrphus glaucius</i> L. |
| <i>Tipula alpium</i> Bgr. | <i>Eristalis rupium</i> F. |
| „ <i>scripta</i> Mg. | „ <i>pertinax</i> Scop. |
| „ <i>fulvipennis</i> Deg. (lutes- | <i>Sphegina clunipes</i> Fln. |
| cens F.). | |

- Bucentes (Siphona) geniculatus* Deg.
Lucilia cæsar L.
Mydæa lucorum Fln.
Phaonia basalis Ztt.
Spilogona denigrata Mg. (*Spilogaaster nigrinervis*).
Hylemyia lasciva Ztt.
 „ *strigosa* F.
 „ *variata* Fln.
Drymia hamata Fln.
Chortophila æstiva Mg. (*Anthomyia sulciventris*).
Fannia (Homalomyia) ænea Ztt.
Azelia cilipes Hal.
 „ *macquarti* Stæg.
Cænosia (Caricea) intermedia Fln.
 „ *pygmæa* „ Ztt. means Mg.
- Dryomyza decrepita* Ztt.
Suilla (Helomyza) lævifrons Lw.
Tetanocera elata F.
 „ *lævifrons* Lw.
Hydromyia (Elgiva) dorsalis F.
Sapromyza illota Lw.
 „ *præusta* Fln.
 „ *decempunctata* Fln.
Sepis cynipsea L.
 „ *flavimana* Mg. (*ruficornis* Mg)
Themira minor Hall.
Hydrellia griseola Fln.
Scaptomyza tetrica Bkr.
Drosophila transversa Fln.
Cetema (Centor) elongata Mg.
Chlorops humilis Lw.
Trineura velutina Mg.

ARACHNIDA (W. Falconer) :—In a tube forwarded by Mr. J. M. Brown were the following arachnids, obtained while searching for insects during the meeting at Sedbergh, all common species, but in the absence of definite records from the locality of distributional value :—

SPIDERS.

- Theridion sisyphium* Clerck. ♀.
Linyphia triangularis Clerck. ♂, ♀s.
Xysticus cristatus Clerck. Imm. ♂, ♀.
Tetragnatha solandrii Scop. ♀.
Zilla atrica C.L.K. ♀.
Meta segmentata Clerck. Many ad. and imm. ♀s.
Lycosa pullata Clerck. ♀.

HARVESTMEN.

- Liobunum rotundum* Latr. ♀s.
Mitopus morio Fabr. var. *alpinus* Herbst. ♀s.
Lacinius ephippiatus C. Koch. ♀.

GALL-MITE.

- Eriophyide* species, Houard 168, galling the inflorescence of *Anthoxanthum odoratum* Linn.

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The Sussex Highlands, by G. G. JACKSON and PRESCOTT ROW. London : The Homeland Association, Ltd., 96+xxxii. pp., 1/- net. This is one of the well-known 'Homeland Handbooks,' and deals with Crowborough, Mayfield, East Grinstead and Ashdown Forest. There are reproductions of photographs of the more interesting features of the areas concerned, and an excellent map and plans.

A Study of Races in the Ancient Near-East, by WILLIAM H. WORRELL. Cambridge : W. Heffer & Sons, Ltd., xiv.+139 pp., 8/6 net. The author is the Associate Professor of Semitics in the University of Michigan, and has spent many years in studying Eastern and particularly Semitic languages, and in this way he has had exceptional opportunities of describing technicalities relating to the early and modern races of the Near East. After dealing with the geography and ethnology of the area, Mr. Worrell has chapters referring to the Mediterraneans, Alpines, Nordics, and Finno-Ugrians ; Hamites and Semites ; and Aryans. There are illustrations of typical representatives of the different races, as well as maps and charts.

FUNGUS FORAY AT STAMFORD BRIDGE.

A. E. PECK.

Hon. Sec. Mycological Committee, Y.N.U.

THE Fungus Foray of 1927 (the 337th Meeting of the Yorkshire Naturalists' Union) was held at Stamford Bridge, near York, from September 17th to September 22nd, with headquarters at the New Inn. Present : Dr. Harold Wager, F.R.S. (Chairman), J. W. H. Johnson, M.Sc., R. Fowler Jones, E. Snelgrove, B.A., Miss D. Hilary, B.Sc., Miss M. Hewlett, M.Sc., F. A. Mason, Greevz Fysher, Mrs. M. Fysher, and A. E. Peck, Hon. Sec. (Members of the Committee); with Messrs. A. A. Pearson (Foray Secretary of the British Mycological Society), S. D. P. Fysher, W. G. Bramley, A. Wentworth Ping, M.A., C. R. Featherstone, M.A., A. J. A. Woodcock, M.Sc., and K. G. Chilman.

Permission had been received to explore the Sand Hutton and Aldby Park estates, the former of which includes the Buttercrambe Woods. The summer of 1927 will long remain remembered for its abnormal rainfall. Much land in the Stamford Bridge district, and even some of its roads, had been under water for weeks together. The unsettled weather continued throughout the meeting, and interfered to some extent with the excursions.

The pastures were singularly devoid of fungi, probably due to their long-continued sodden condition.

The woods, however, furnished plenty of specimens, and quite as many were brought in as could conveniently be dealt with.

The Committee was extremely pleased to have present with them Mr. A. A. Pearson, whose intimate knowledge of the Agarics in particular greatly facilitated the determination of species in that great group.

A notable early specimen to be brought in was a giant puff-ball (*Lycoperdon giganteum*) sufficiently large to provide a sideline at breakfast for several mornings. No other well-known edible species were encountered in quantity to make them of interest for the table, except *Psalliota silvicola*, and it was neglected.

Another early arrival of interest were handsome specimens of *Marasmius cohærens*, a fungus about the size of its ubiquitous relative, *M. peronatus*, but possessed of, and truly distinguished by, its hard, horny, dark-brown, polished stem. Mr. Pearson showed its brown, fusiform-subulate, very-pointed cystidia under the microscope, an exhibition to be remembered. The specimens were collected by the writer at one spot only, which he well remembers. The species is 'uncommon.' Mr. Greevz Fysher brought in upon his bicycle the biggest and heaviest specimen of the meeting, viz., *Polyporus squamosus*, which he had cut from a tree near the entrance of Aldby Park. It measured 18½ in. wide by 15 in. deep. Its stem had a diameter of 4 in. at the point of severance, and a circumference of 16 in. at a distance of 3½ in. from that point. It weighed 9½ lb.

The one charming specimen of *Tricholoma inodermeum* was found by the writer at Bossall Wood under Beech trees, in company with troops of the slimy, white, edible fungus, *Hygrophorus eburneus*, which latter species was not seen elsewhere. The specimen referred to was at first believed to be Mr. Rea's species, *Tricholoma horribile*, but when sent to him was named as stated. Cooke's plate, No. 1120, faithfully depicts this rare and beautiful agaric. The dark-coloured radiating scales on the red-tinted pileus, and the stem with uneven rufescent blotches were features seldom met with. The uneven blotches of colour were a strong reminder of *Inocybe godeyi*, which is a less substantial plant, however.

No fewer than fourteen species of *Lactarius* were recorded, of which *L. pallidus* and *L. subumbonatus* were most plentiful. The genus *Russula*

furnished 17 species, none uncommon. The genus *Cortinarius* was also well represented in the district with fourteen records, chiefly dealt with by Mr. Pearson. The common field mushroom was not seen, though seven other species of its genus, *Psalliota*, were recorded, *P. amethystina* being new to the County, and *P. peronata* being a second record only.

The specimens of *Boletus erythropus* recorded were no doubt the same thing as have been frequently recorded as *B. luridus*, the two species having been scarcely sufficiently differentiated by Massee. *B. luridus* should have a yellow stem reticulated with blood-red veins. In *B. erythropus* the stem is yellow, punctate with red (Rea).

Buttercrambe Wood produces in fair numbers, well distributed, a fungus, the identity of which has not yet been satisfactorily established. It has cap, gills and stem of light-brown colour, and passed as *Tricholoma gausapatum* Fr. throughout the meeting without question. Subsequent investigation has resulted in the record being deleted, with no positive determination to replace it. The writer hopes that new specimens may be obtained and the mystery solved. This fungus was such a feature of the meeting that the writer conceives that no report would be complete without reference thereto, however one may deplore the position as disclosed.

Mr. Pearson had the satisfaction of meeting with his own species of *Sebacina subhyalina* Pearson, which occurred on a dead trunk in Aldby Park.

In all 228 species were recorded, of which eight were new to Yorkshire and 52 new to the S.E. division of Yorkshire. A list of the more interesting species is given below, with annotations by the County Recorder, Mr. F. A. Mason.

At an evening gathering Mr. Johnson spoke upon the Mucors, and gave an account of their classification, with a key for the determination of species. He described their methods of reproduction, and the means by which cultures could be made for microscopic examination. A cordial vote of thanks for this paper was proposed by Mr. A. A. Pearson and carried unanimously.

On another evening Mr. Pearson gave a brief account of microscopical structures in the fungi, which are of use in classification. He showed the importance of Cystidia in the determination of genera and species, gave a description of typical forms of Cystidia in various species, and described methods of investigation. Reference was also made to the necessity of determining as accurately as possible the size and shape of spores, especially in critical species, and whether the number of spores developed on a basidium is one, two, or four. A hearty vote of thanks was accorded to the author for his most interesting communication.

At the Business Meeting the following were added to the Committee : A. A. Pearson, S. D. P. Fysher, and A. Wentworth Ping, M.A.

Egton Bridge and Sledmere were under consideration for visitation next year.

Amanita phalloides.

,, *mappa.*

†*Amanitopsis fulva.*

Lepiota naucina Fr.

†, , *clypeolaria* (Bull.) Fr.

†*Tricholoma flavo-brunneum.*

†, , *imbricatum.*

* , , *inodermeum* Fr.

†, , *nudum.*

Clitocybe odora.

†, , *splendens* (Pers.) Fr.

†, , *expallens* (Pers.) Fr.

Collybia tuberosa (Bull.) Fr., on dead agarics.

†*Laccaria amethystina.*

Mycena iris Berk.

†, , *metata.*

†*Pleurotus corticatus* Fr.

†*Hygrophorus eburneus.*

Lactarius chrysorrheus.

,, *deliciosus.*

,, *pallidus.*

†, , *theiogalus.*

†, , *vietus.*

- †*Lactarius subumbonatus*.
 † „ „ *cimicarius*.
 †*Russula fragilis* var. *fallax*.
 † „ „ *chloroides*.
 †*Cantharellus tubæformis*.
Nyctalis asterospora.
Marasmius harliolorum.
 † „ „ *cohaerens* (A. & S.) Cke.
 †*Androsaceus splachnoides* (Hornem) Rea.
 †*Pluteus cervinus*.
 † „ „ *salicinus*.
Entoloma rhodopolium.
 † „ „ *prunuloides*.
Nolanea pisciodora.
 †*Eccilia grisea-rubella* (Lasch.) Fr.
 **Pholiota blattaria* Fr.
 † „ „ *ægerita* (Porta.) Fr.
 **Inocybe corydalina* Quel.
 „ „ *rhodiola* Bres.
 †*Astrosporina petiginosa* (Fr.) Rea.
 * „ „ *calospora* (Quel.) Rea.
 * „ „ *umbrina*.
 †*Flammula ochrochlora* Fr.
 †*Naucoria escharoides* Fr.
 † „ „ *striæpes* Cke.
 † „ „ *badiipes* Fr.
 †*Cortinarius* (Phleg.) *infractus*
 (Pers.) Fr.
 † „ „ *(Ino.) pholideus* Fr.
 † „ „ *(Ino.) semisanguineus*
 (Brig.) Maire.
 † „ „ *(Tel.) brunneus* (Pers.) Fr.
 † „ „ *(Tel.) rigidus* (Scop.) Fr.
 † „ „ *(Hydr.) castaneus* (Bull.) Fr.
- †*Cortinarius* (Hydr.) *obtusus* Fr.
 †*Psalliota xanthoderma*.
 „ „ *silvicola*.
 † „ „ *hæmorrhoidaria*.
 * „ „ *amethystina* Quel.
 † „ „ *peronata* Massee.
 †*Hypholoma velutinum*
 „ „ *radicosum* Lange
 (= *Flammula inopus* Cke).
 †*Psilocybe bullacea* Bull.
Bolbitius titubans.
Coprinus lagopus.
Psathyrella gracilis (Pers.) Fr.
Gomphidius gracilis Berk.
 †*Boletus erythropus* (Pers.) Quel.
 „ „ *felleus*.
 **Polyporus stipticus*.
 † „ „ *tephroleucus* Fr.
 †*Ganoderma applanatum* (Pers.)
 Pat. (= *Fomes applanatus*)
Hydnellum auriscalpium Linn.
 †*Phlebia merismoides*.
 **Hypochnus echinosporus* (Ellis)
 Burt.
 **Sebacina subhyalina* Pearson.
 †*Peniophora setigera* (Fr.) Bres.
 † „ „ *quercina* (Pers.) Cke.
Tremella foliacea (Pers.) Fr.
 †*Bovista plumbea*.
 †*Scleroderma verrucosum*.
Macropodia macropus (= *Helvella*
 macropus).
 †*Calycella flava*.
Galactina badia.
 †*Peronospora parasitica*.

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ADDENDUM.

In my report above I referred to a fungus which passed throughout the foray as *Tricholoma gausapatum*, which determination Mr. A. A. Pearson subsequently asked to be deleted in the light of further facts which he had obtained.

I again visited Stamford Bridge on October 16th, a month subsequent to the foray, and found a good colony of further specimens. Rubbing off the gills of one to see if a 'cartilagenous pith' lay below, I found it present, but what was of further interest was that the whole mass exposed immediately turned black. This I knew to be a character of *Tricholoma immundum*, recently renamed *Collybia fumosa*, which, however, has globose spores, while my specimens had elliptical spores. I eventually identified it as *Collybia semitalis*, a determination which was confirmed by Mr. Carleton Rea in the words: 'Your specimens are typical *Collybia semitalis*. It is a species I know fairly well, as I see it most years, and I have already seen it twice this year.' Two days later, Mr. Rea sent me specimens of *Collybia fumosa* for comparison. To be able to compare such nearly related species was an unusual and pleasing experience.

In my hunt for *Collybia semitalis* Fr., I also obtained the following species, which were not met with at the foray:—

Clitocybe nebularis.

Hypholoma sublateritium.

Tricholoma personatum.

Dædalea quercina.

<i>Tricholoma melaleucum.</i>	<i>Bulgaria polymorpha.</i>
<i>Pholiota squarrosa.</i>	<i>Stropharia inunctus.</i>
<i>Inocybe tomentosa</i> (Jungh.) Quel. (= <i>I. euteles</i> B. and Br.).	<i>Hygrophorus pratensis.</i> ,, <i>niveus.</i>
<i>Hebeloma versipelle</i> Fr.	

The two first-named species are excellent edibles, and my gatherings pleased several Scarborough mycophagists. *Hebeloma versipelle* possesses a tenacious glutinous pellicle, which gives almost a rubber-like strength to the cap of the toadstool. After the remarkable elastic-like pellicle is stripped, however, the underlying flesh is as tender and brittle as is usual in these plants.

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CORRESPONDENCE.

SWALEDALE GLACIAL GEOLOGY.

Under the above title Prof. Gregory has several statements in the October number of *The Naturalist* which call for comment and criticism. Speaking of the relatively rare boulder clay in the lower part of the Dale, he says (p. 294), 'Carvill Lewis was right as concerns the part of Swaledale between Reeth and Richmond, as to the absence of the glaciation which deposited the many well-preserved Yorkshire moraines. The only moraine which I saw in the valley lies across the Dale at Grinton.' Now it is just this glaciation which has filled the lower part of Swaledale with glacial remains, comparable with those of any other part of Yorkshire. One need only instance the magnificent series of overflow channels and associated lateral moraines, between Arkledale and Richmond, with their lakes and deltas, the great 'in-and-out' of Round Howe, near Richmond, and the frequent splendid sections in true boulder clay obtained in and around Richmond and Marske, as indicative of the very active glaciation of this dale during the later periods of the glaciation of Yorkshire. In the valley bottom a terminal moraine crosses the valley at Marrick, comparable in size and clearness with the Grinton moraine described by Prof. Gregory as the lowest in the dale, and marking not the furthest extension of the ice down the dale, but one in a long series of retreat positions of the dwindling Swale glacier. Referring to sections in the drift near Grinton, the statement is made, 'both these glacial drifts belong to an early glaciation, during which a local glacier flowed down Arkledale and Swaledale above Reeth, and ended at Grinton . . . but both belong to the earlier stages of the Yorkshire glaciation.' In the Vale of York, towards Yarm, there are two boulder clays, of which one can definitely be shown to belong to the earlier glaciation, but the drifts described near Reeth, both belong to the upper clay of the later glaciation. If the moraine at Grinton, and the others which Prof. Gregory did not notice, do belong to the earlier glaciation, one is tempted to ask how, as they consist of very sandy clay and gravel, they survived the heavy glaciation which, in the later stages of the Yorkshire story, impounded lakes and deposited lateral moraines on the hill slopes of Swaledale to a height of a thousand feet above their position in the valley floor? The evidence of striated rock surfaces, transported chert boulders, lake channels, and lateral moraines, all proves that the glaciation of Swaledale during the later part of the glacial period was very extensive, and that the Grinton and other terminal moraines in the valley belong to the very last phase of retreat of the ice. This evidence has already been published, though not noticed by Prof. Gregory in his summary of the literature of Swaledale.*—ARTHUR RAISTRICK.

* 'The Glaciation of Wensleydale, Swaledale, and adjoining parts of the Pennines.' A. Raistrick. *Proc. Yorks. Geol. Soc.*, Vol. XX., Part III., 1926, pp. 366-410.

PROF. GREGORY'S REPLY.

Mr. Raistrick states that I did not notice various moraines in Swaledale with the exception of one, although in the part of that dale I visited there is a 'magnificent series of overflow channels and associated lateral moraines,' and also a terminal moraine at Marrick 'comparable in size and clearness' with the Grinton Moraine. The 'unnoticed' moraines above Reeth I referred to as morainic drift; Mr. Raistrick remarks (*Proc. Yorks. Geol. Soc.*, N.S., XX., p. 379, 1926), 'In Upper Swaledale not many moraines can be definitely recognized, though mounds of morainic material are common.' They are so denuded that I think they are better described as morainic material or drift than as moraines. That the terminal moraine at Marrick is comparable in size and clearness with the Grinton Moraine would not be inferred from Mr. Raistrick's paper. He there described the Grinton as a 'larger terminal moraine' blocking the valley and rising 60 ft. above the floor; and he refers to it again (p. 397) as a large moraine; whereas though he mentions a moraine at Marrick (p. 404) and refers inferentially to it on p. 396, and it is marked on his map, there is no definite information about it. The exposures in the drift at Marrick are unsatisfactory, but, it seemed to me, redeposited material, like some of the other formations which Mr. Raistrick calls moraines in that part of Swaledale. That Mr. Raistrick's use of the term moraine is more inclusive than mine is shown also by his remark (p. 372) that 'in Swaledale it is very difficult to separate drumlin and lateral moraine, as they seem to pass one into the other in the greater part of the valley.'

The excellent preservation of the moraines in the district renders the more significant their denuded, fragmentary condition in Middle Swaledale. Carvell Lewis having represented that locality as unglaciated the main purpose of my note was to state that this view could not be maintained. I regret not having seen Mr. Raistrick's valuable memoir on the area, but that number of the journal had not been received in the set through which I looked before visiting Swaledale. The remarkable difference in preservation between the denuded drifts in Swaledale between Reeth and Richmond, and the moraine at Feldom, of which Mr. Raistrick says that 'the surprisingly sharp contours and steep sides' suggest its late origin (p. 397) may have led me to over-estimate the age of the Grinton Moraine. But neither Mr. Raistrick's memoir nor note appears to me convincing. I am reluctant to differ from him on an area which he knows so well, but doubt whether, during the formation of the Wensleydale moraines, and those that pass through and to the north-west of Richmond, the whole of Swaledale was re-occupied by a glacier. The transport of the erratics and the ice-flow indicate that the main ice passed across Upper Swaledale, though a small branch doubtless passed down the dale, and deposited the morainic drifts above Reeth.

Negative evidence is doubtful, except after a detailed examination, and I am glad, therefore, to note from Mr. Raistrick's memoir the absence of erratics and of direct evidence of glacial action on the moors just south of Reeth and Grinton. He refers to the presence of transported chert boulders as evidence of the late glaciation of Middle Swaledale, but as chert is extensively developed near Grinton, such boulders may be indigenous and not erratic. In Upper Swaledale and Lower Swaledale, on the contrary, erratics are abundant, as also in eastern Wensleydale, and in the country a few miles north and east of Middle Swaledale.—J. W. GREGORY.

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A portrait and obituary notice of the late G. C. Champion appear in *The Entomologist's Monthly Magazine* for September; and the same journal for October contains a list of the *Corixa* recorded for Cumberland.

NEWS FROM THE MAGAZINES.

Field Notes from Lakeland appear in *British Birds* for October.

W. S. Berridge writes on 'The Hare' in *The Animal World* for November.

The 1927 irruption of the Crossbill is dealt with in *British Birds* for November.

The Scottish Naturalist, No. 167, has several notes on the Crossbill Influx of 1927.

'Ancient Jades,' by K. C. Wong, is the title of a paper in *China Journal* for October.

The Zoological Record for 1926, Volume 63, was published early in November, and contains 1142 pages.

We have received a copy of the appeal to nature lovers issued by the National Trust in connection with the preservation of Wicken Fen.

The Poppleton (Yorks.) Beet Sugar Factory is illustrated and described in *The Journal of the Ministry of Agriculture* for October.

'The Swede Midge' and 'The Economic Status of British Finches' are subjects dealt with in *The Journal of the Ministry of Agriculture*, Vol. 34, No. 6.

James A. Greig writes on 'Decapoda Crustacea from the West Coast of Norway and the North Atlantic,' in *Bergens Museums Aarbok*, published at Bergen.

The Journal of the Ministry of Agriculture for November contains 'Further Observations and Experiments on the Control of Liver Fluke,' by C. L. Walton and W. Rees Wright.

G. P. Whitley figures 'Angler Fishes' in *The Australian Museums Magazine*, Vol. III., No. 3. Some of the illustrations might be the result of 'D.T.'s—from what we have heard about them.

In Part LXV. of S. S. Buckman's 'Type Ammonites,' *Dactylioceras commune* from the Alum Shale at Whitby is rechristened *Nomadactylites temperatus* S. Buckman, 1927, T.A. vi., 43 Hildoceratan, *bifrons*, Genotype, Holotype, cf. DCCVII.

At the Annual Meeting of the Belfast Natural History and Philosophical Society, recently held, Professor W. B. Morton, Very Rev. Dean Carmody, Robert Welch, and Robert Bell were elected honorary members of the society.

We learn from *The Medical Herbalist* that 'Shepherd's Purse' is so called on account of its purse-like seed-pods.' We thought that like Sheppard's purse, it was because it was always empty. The same journal tells us that 'Self-heal (*Prunella vulgaris*) is useful in sore and relaxed throat, also in internal bleeding, leucorrhœa, etc.'

Dr. Benjamin Daydon Jackson, the eminent botanist, renowned internationally as the author of the 'Index Kewensis,' an exhaustive dictionary of flowering plants and their native countries, has died at the age of eighty-one after a motor accident on October 1st. For many years he has been a familiar figure at the Linnean Society's rooms, where, as Secretary of that Society, and more recently as Curator of its Linnean Collection, he did much good work.

The Editor of *The Entomologist's Record* states that a subscriber writes: 'May I suggest that our Editor gives us a bit more English and not so much of the Foreign matter during 1928. All of us are not experts; in fact, I am of opinion it would meet the views of the bigger proportion of your subscribers.' To this the Editor replies: 'It is always the case that those who want English articles are among those who never contribute themselves. That is, they are all take and no give. They want everybody's brains and experiences, but have no sense of mutual confidence and aid.'

REVIEWS AND BOOK NOTICES.

The Heart of a Bird, by **Anthony Collett**. London : Nisbet & Co., viii. + 287 pp., 10/6 net. Here the author takes the birds month by month, and gives an interesting record of the various species to be met with, their habits, and methods of nesting. Mr. Collett is by no means a new author, and has a very good literary style which is of considerable assistance in perusing the pages. There are eight plates illustrating Kestrel ; Long-tailed Tit's Nest among Blackthorns ; Cuckoo in Reed Warbler's Nest ; Curlew Settling on her Eggs ; Gannet Climbing into its Nest ; Swift Clinging Beneath its Nest-Hole ; The Dabchick ; and A Brooding Eider-Duck.

The Charm of Birds, by **Viscount Grey of Fallodon**. London : Hodder & Stoughton, xii. + 243 pp., 12/6 net. The first occasion upon which we had the pleasure of meeting the author of this book was in London when the wireless was first installed in the Hotel Cecil, and by its aid those present were able to hear the songs of birds alleged to be singing, we believe, in the Channel Islands. That was many years ago when wireless was in its primitive form, and while the interference of the electric trams on the embankment rather spoilt the avian concert, all those present were well rewarded by the charming address given by Earl Grey. Obviously he is a lover of birds in every way, and his present volume is a record of his observations thereon. He deals with the birds of the various months, and then has chapters on Courtship ; Nests and Eggs ; Joy Flights and Sounds ; The Cuckoo and the Sparrow ; On Taming Birds ; Waterfowl, and so on. The volume is illustrated by woodcuts by Robert Gibbons.

A Standard Catalogue of English Names of our Wild Flowers, by **J. F. Rayner, F.R.H.S.** (London : Simpkin, Marshall, 51 pp., 1/6). This is an attempt by the author to stabilize the common names of British Wild Plants, with a view to overcoming the difficulty due to the multiplicity of common names for the same species, some of which have sixty to seventy. That the same species should be known by different names in different countries, and even in different parts of the same country, is natural, and this forms a study of great interest to the philologist. To the student of wild flowers, however, this is often confusing, and he would often be glad to have an English name which would be as definite as its botanical name. This Mr. Raynor has tried to do. An obvious difficulty is to make an acceptable selection, and here differences of opinion are sure to arise, but he has reduced this considerably by calling in the aid of several well-known botanists.

Elementary Botany, by **W. Watson, D.Sc.** (London : Edwin Arnold, vi. + 368 pp., 6/6). The author of this excellent textbook says he was told that a certain naturalist was not a botanist, although he was able to name most of the British flowering plants when he saw them growing. Botany means much more than the naming of wild flowers, and the object of this book is to encourage that wider outlook, while at the same time it emphasises the need for field work and regular contact with the plant as a living thing. Plant structure and morphology are studied from familiar and easily-obtained examples, and function is studied in relation to form. Simple exercises and experiments are given to emphasise the more important facts and principles. The illustrations, of which there are 225, are clear and carefully chosen, and in addition to the study of flowering plants, there is a chapter on Heredity, Variation and Evolution ; and, in order to broaden the general outlook on plant life, the volume concludes with six chapters on the Fern, Gymnosperms-homologies in Spermophyta and Pteridophyta, Mosses and Liverworts, Algae, Fungi, Yeast, Bacteria and Lichens.

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It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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CORRIGENDA.

- Page 64, line 26, for 'Crustaceous,' read 'Cretaceous.'

,, 113, line 9, for 'Middlesbrough' read 'Middlesceugh.'

,, 179, line 3, for 'F. G. Percival' read 'E. Percival, B.Sc.'

,, 241, line 42, for 'Erdzurus' read 'Ecdyurus.'

,, 241, line 43, for 'Erdzurus' read 'Ecdyurus.'

,, 241, line 50, for 'Lenetra' read 'Leuctra.'

,, 241, line 58, for 'procipes' read 'fuscipes.'

,, 242, line 42, for 'mezeri' read 'meyeri.'

,, 242, line 44, for 'Microptema' read 'Micropterna'

,, 242, line 46, for 'Gerres' read 'Gerris.'

,, 325, line 1 (under illustration), for 'Dicranella' read 'Dicranomyia.'

PLATES.

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